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# THE ROLE OF PRODUCT INNOVATION IN TRADE FLOWS OF HOUSEHOLD APPLIANCES BETWEEN CANADA AND THE U.S.A.

by

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ABSTRACT

This dissertation examines patterns of trade between Canada and the United States in major electrical and electronic appliances. It attempts to measure Canadian import propensity and ownership patterns over the life cycles of some thirteen products.

The research represents an attempt to test empirically the thesis set forth by Vernon[1] that trade flows in such categories of goods are determined more by product innovation than by factor costs. Vernon suggests that the nature of the innovation process is such that new consumer durable products will tend to be produced and marketed first in the United States, exported to other developed nations, and eventually be produced in these other nations. This theory is popularly called the "Product Life Cycle" theory of trade. The thesis sets out to test

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(1) Vernon, Raymond, "International Investment and International Trade in the Product Cycle," Quarterly Journal of Economics, May, 1966.

this pattern by gathering and examining detailed actual data on trade between Canada and the U.S. in electrical appliances.

Data for the study were gathered from many sources. Executives of major appliance manufacturing firms in Canada were approached, and provided a great deal of original data from their records. Other data came from Canadian and U.S. government publications, industry associations, and from leading trade magazines. The presentation of these data is in the form of a tabulation of 20 years of experience for each major appliance, highlighting trends in such measures as Canadian import propensity, Canadian and U.S. unit sales volume, average factory prices, and import-export prices.

The major hypotheses examined were:

1. that Canadians would have a high propensity to import new products from the U.S., and that this propensity would decline as products matured.
2. that the gradual displacement of imports by Canadian production would be accompanied by heavy imports of component parts from the U.S. which in turn would also be displaced over time.
3. that gross margins would be higher in the

early years of a product's life, declining as the product matured and Canadian ownership of production increased.

4. that the average price of U.S. exports to Canada, before freight and duty, would be higher than the U.S. average factory price for the product involved, and that the landed price in Canada would be higher than the average Canadian production cost, and the average Canadian factory price.

These hypotheses were strongly supported by the data gathered. It became clear that U.S. exports of appliances to Canada were differentiated in some significant ways from Canadian production of the same appliance. The U.S. products commanded a price premium, and the Canadian appliance industry was almost totally dependent on its U.S. counterpart for new product innovation. U.S. Subsidiaries were invariably first to introduce new appliance products to the Canadian consumer and also to establish manufacturing operations in Canada. This form of leadership caused independent Canadian firms to have to compete largely in mature products.

Several implications flow from the study. National agreements to rationalize production and reduce Canadian costs, under a tariff-free system, will not by themselves result in access to the U.S. market for Canadian-owned

firms. Such firms would also require access to product and market research and the resources and power to market over a large region. If the achievement of these conditions does not precede any move toward tariff removal, it seems likely that Canadian independents will have difficulty surviving, U.S. subsidiaries will gain greater control of the Canadian market, and the managerial and professional staffs in the subsidiaries will be centralized in their U.S. head offices under the impetus of production rationalization.

ACKNOWLEDGEMENT

This dissertation constitutes an attempt at empirical verification of a model developed by Professor Raymond Vernon of the Harvard Business School. It is therefore indebted to the pioneering work of Professor Vernon and others, from whose efforts it originated.

The gathering of vital data from major appliance companies operating in Canada required considerable time input on the part of company executives, and a willingness to provide access to classified information. The constructive cooperation of these executives was an outstanding feature of an exciting exercise in data collection.

This thesis was supervised by Professor David Leighton, whose continuing encouragement was an important source of assurance during times of doubt. His many suggestions as to form and style were very helpful in the latter stages of the work, and his willingness to meet in "brainstorming sessions" in the early stages was responsible for the generation of many stimulating ideas.

During the course of my doctoral program, I was the grateful recipient of financial assistance at different times from both the Canada Council and the University of Western Ontario.

The onerous task of typing and proofreading was cheerfully and competently tackled by Miss Anne Marie Traher.

In the final analysis, one must accept full responsibility for the content and emphasis of one's work. This I gladly do.

H.C.

April, 1970.

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PART 1

# CHAPTER I

## Social Implications

Most of the advanced nations of the world have become advanced through the development of a healthy and dynamic secondary industry sector in their economy. Prices of industrial goods have risen considerably faster than prices of raw materials and agricultural products, and industrial development has become synonymous with economic progress. Moreover, the wide proliferation of industrial goods and associated services is an indication of the imagination, initiative, and educational levels required for growth in the industrial sector.

Canada, like many other developed nations, has tried to develop its secondary industry behind protective import tariffs. This has been a deliberate policy aimed at stimulating the development of manufacturing facilities in Canada to provide jobs for Canadian managers and professionals as well as labourers and skilled tradesmen. Naturally the

imposition of tariffs curbed imports of industrial goods, and provided an incentive to firms exporting to Canada to locate manufacturing plants here to preserve their established markets. The tariff barrier provided an equal opportunity to Canadians to develop their plants and displace imports via domestic production. This opportunity, however, was not extensively seized by Canadians and most of the industrial expansion in Canada was carried out and financed by foreign competition. A large percentage of this foreign investment came from large U.S. firms establishing subsidiaries or branch plants in Canada. Thus, in a sense, much of Canada's post war industrial boom was a result of U.S. entrepreneurial initiative in seizing investment opportunities, and the availability of U.S. private risk capital. The U.S.-owned subsidiary in Canada has simply become a major competitive factor in all walks of Canadian business life.

Many Canadian economists have expressed the view that the U.S. subsidiaries in Canada are largely responsible for the emergence of an oligopolistic competitive structure in many Canadian industries (21). They feel that this structure, coupled with tariff protection, had led to the establishment of many sub-optimal scale manufacturing plants pricing up to the height of the tariff barrier. Add to this the problem of diversity of lines due to our relatively small market, and Canada's secondary industry is just not internationally

competitive.

Many Canadian businessmen, however, observe the critical advantages of the subsidiary as being in the areas of research, finance, product and process innovation, and marketing. They view the industrial sector as subject to rapid and far-reaching change, with foreign subsidiaries in the forefront because of their access to parent company research, engineering, financial and marketing programs. Thus in general the economist has tended to emphasize the costs of tariff protection and subsidiary operations in terms of lower production efficiency and higher consumer prices, while others have pointed to the benefits gained in terms of development and standard of living.

Accompanying the growth in Canadian industry is a separate but related phenomenon - the growth in education. Education levels are advancing rapidly in Canada with the greatest percentage growth in university and postgraduate enrollment. To some degree industry provides a direct stimulus to Canadians to obtain advanced education by offering positions in the country which utilize knowledge and skill and reimburse their possessors. At the same time much of the huge cost of education is paid from funds generated by the industrial sector. As time unfolds, industry is going to be faced with the continuing task of absorbing

an increasingly sophisticated and well-educated Canadian workforce and providing it with challenging, meaningful positions.

These social and economic problems are brought into focus as Canada considers the question of entering free trade arrangements with the United States.

Economists have so far tended to examine the free trade question from the standpoint of conventional trade theory. The conventional explanation for the movement of goods and services between countries is that it is based on comparative advantage. According to this theory countries will tend to export to one another those goods and services in which they have the greater relative advantage via lower production costs. The theory has led economists into extensive analysis of different countries' input or factor costs (i.e., the relative costs of labour, capital and land), on the assumption, other things being equal, that factor prices will determine production costs which in turn will determine trading advantage. In this context, tariffs and exchange rates are regarded as extraneous costs. The principal emphasis of the theory has clearly been placed on relative production or manufacturing costs. The Auto Pact, for example, is usually discussed in terms of the rationalization of production facilities and the associated economies of in-plant specialization.

Since it has had a very favorable impact on Canada's balance of trade with the U.S., some economists see the Auto Pact as a model of the impact of free trade on a wider scale. However, the auto industry in Canada was unique in that it was controlled almost completely by U.S. subsidiaries. There were no independent Canadian producers. For this reason the Canadian government had to lay down specific guidelines to the U.S. parent companies for post auto pact trade flows in both automobiles and parts. The favorable balance of trade effect was thus negotiated into the pact by the Canadian government and was not the result of the free play of competitive forces under free trade. (This, parenthetically, is what so upsets U.S. politicians). Furthermore no marketing problems arose under the auto pact since all four competitors already had extensive marketing and distribution organizations throughout both Canada and the U.S., and could continue to market a full line of automobiles in both countries despite the fact that not all models were produced in both countries.

The question of how the Auto Pact affected the number of managerial and professional jobs available in Canada remains open to speculation. It might be expected, in the absence of the tariff barrier, that the problem of what to produce and where to sell it would become one centralized logistics problem for the entire North American content, resulting in the centralization of more managerial

and professional staff functions. No documentation is currently available on the overall change in such functions as a result of the pact, but several subsidiary executives in the appliance industry voiced concern over the movement of their counterparts in the auto industry from Canada to the U.S. If the concept of production rationalization were extended to other industries it seems possible that the resulting decline in jobs requiring high educational qualifications may clash seriously with the increase in Canadians having these qualifications. A branch plant economy simply does not require the educational sophistication that Canadians seem determined to achieve. It would seem appropriate under these conditions for managements of Canadian subsidiaries to give some constructive thought to the provision of an expanded flow of professional and managerial jobs for Canadians regardless of the outcome of the free trade question.

Many Canadian politicians have voiced concern about the extent of U.S. control over Canadian secondary industry, despite the fact that this might have been expected as a consequence of prior governmental tariff policies. Canada is said to be in danger of losing its autonomy, in the economic field at least, to its mighty neighbour. Plans have been suggested to "buy back Canada" via such devices as the Canadian Development Corporation.

The thorn in the side seems to be the overall lack of Canadian control over domestic business activities. One particularly disturbing manifestation of this is the lack of control over the timing and size of parent company repatriation, which may take the form of dividends, management fees, licensing payments, etc., from the Canadian subsidiaries. In aggregate these repatriation activities do constitute a large and uncertain drain on Canada's current account; but at the same time they do not appear to be large in relation to the vast stock of foreign direct capital in the country. And many subsidiaries of large U.S. firms who pay management or licensing fees to parents consider the payments to be very small in relation to the benefits and services obtained.

Canada is thus faced with at least three major national economic and social issues - the competitiveness of its secondary industry in world markets, the extent of control of its secondary industry by foreigners, and full employment of its diverse and changing labour force. In the long term, international competitiveness is the dominant objective, but in the short term it must be realized that these issues are interdependent and must be resolved on some more or less compromise basis. It would be dangerous indeed to overlook the interdependence and stress one issue at the expense of others. For example, the solution pro-

posed for the first issue is free trade or tariff reduction, but this may be entirely inconsistent with (and indeed diametrically opposed to) the second - i.e., control over our own destiny, and may have unwanted effects on the third by reducing employment opportunities in Canada for managerial and professional people. It is possible that by moving to free trade we may not only lose a substantial part of our managerial talent, but at this stage of our development we may also increase the likelihood of U.S. companies taking control of Canadian consumer goods industries for marketing reasons, and reduce the likelihood of Canadians investing risk capital in new Canadian ventures.

Moreover, there appears to the author to be a major flaw in applying the traditional theory of comparative advantage to an analysis of the effects of free trade. This comes about through the implicit assumption that economies in production are the main factors to consider. Comparative advantage is a static concept capturing an image of events at one point in time, whereas secondary industry is essentially dynamic and adaptive. A country's comparative advantage in a given product is likely to change over time and the speed and direction of change can and should be anticipated. The future demand for many products is very difficult to forecast due to the rate of displacing innovations in related industries. Many business executives mention the role of experience in reducing pro-

duction costs, which suggests that those who manufacture first gain an innovative lead in cost reduction that later competitors may never catch. Once the dynamic changing nature of secondary industry is admitted, it becomes increasingly clear that research and marketing skills, which create and capitalize on innovations, are critical competitive factors. Indeed it may be argued that innovation causes trade.

It makes a great deal of difference to the policy outcome if the free trade question is examined from the standpoint of innovation rather than the standpoint of production. Emphasis on production economies leads automatically into studies of relative production efficiency between Canadian and American plants and into policies designed to raise Canadian productivity. The spotlight focuses on how Canada can achieve U.S. economies of scale and specialization, and reduce costs of component parts. A tariff free arrangement between Canada and the U.S. would certainly provide these advantages and would reduce Canadian production costs, particularly for U.S. subsidiaries. Indeed it seems that if one is willing to accept the "relative production cost" approach, one has in fact a prima facie case for free trade.

On the other hand, where a product is significantly differentiated and hence relatively inelastic in its response to price variations, cost of production assumes less

importance as a determinant of price. In the early stages of a product's life, when its design is subject to frequent change, comparisons of production costs between countries are unlikely to explain patterns of trade. The innovating firm may possess technological or design advantages which are simply not available to firms in other countries. To the extent that the market develops first in the country where the innovation was introduced, it is possible that firms in that country may retain their advantage after their technological lead expires, due to access to domestic scale economies. From the standpoint of firms in other countries, the problem is not that they cannot design as economical a production facility as the innovator, as much as it is that they cannot sell the volume required to sustain such a facility. The achieving of production scale economies, given a market of sufficient size, is essentially a problem of marketing. When a product does pass into the mature phase, when design has stabilised, competition has increased, price has been forced down towards cost and the now relatively undifferentiated product has taken on many of the characteristics of a commodity, the more aggressive firms begin to phase out of its production and concentrate their resources on some displacing or new product innovation. Firms or countries which compete only in the "mature" product markets generally face spiralling price competition, low profits and hence inadequate funds to direct into research and marketing programs. And furthermore they must

face the real and frequent danger of their specialized mature products being attacked by displacing new products from more innovative firms or countries. Such market erosion can be very serious for those firms or countries that have specialized extensively in the dwindling products.

It is often the case between Canada and the U.S. that a product which is mature in one country is also mature in the other. However, it should be recognized that maturity, in the sense referred to in these paragraphs, is defined in terms of a slow-down or peaking of the absolute level of consumption in a given country, and that what is "mature" in country A may not be mature in country B. This is a natural result of differences in speed of adoption by other countries of products innovated in country A. It should also be recognized that the competitive pressure of the mature stage sometimes gives rise to the development of new features which may prolong the price-elasticity of the product. This further suggests the possibility that firms may move from mature product manufacturers to product innovators, provided, of course, they have the marketing strength to capitalize on such a move.

For a country or firm to take on an innovating role it must place greater emphasis on marketing strategy, including market oriented research, new product development and large scale marketing programs which capitalize on the research. This marketing approach to innovation requires

considerable capital concentration in large firms, a well-educated general workforce and high levels of managerial skill - a significant and worthwhile challenge for any firm or country and one which Canada cannot afford to ignore. If free trade with the U.S. is embarked upon, then Canada will either compete in the innovation arena or be dominated as a mature product manufacturer.

It is the purpose of this dissertation to show that, in products where research and marketing costs dominate, innovation is the more relevant criterion by which to judge the impact of free trade. This is of considerable social importance because the entire free trade question is laden with potentially severe and irreversible problems of dislocation in Canada.

# CHAPTER II

# REVIEW OF PERTINENT LITERATURE

## Classical Trade Theory

Classical economic theory on international trade holds that the flow of trade from country to country is caused by the relative prices of factors of production in those countries. The factors of production are normally classified as labour, capital and land, and their prices are related to their abundance or scarcity. Thus for a nation to have a comparative advantage in a capital-intensive product it would have to have a relative abundance of (and low prices for) capital. Nations would tend to export goods that required the use of their abundant factors and import goods requiring their scarce factors of production. In this context international trade may be viewed as a great equalizer of the uneven "natural" distribution of population, wealth and arable land between nations, and any artificial barriers to the free flow of trade may be viewed as interfering with international efficiency.(1).

In an attempt to provide empirical support for the classical theory, Wassily Leontief made a study of U.S. imports and exports with surprising results. "America's participation in the international division of labor is based on its specialization on labor-intensive, rather than capital-intensive, lines of production".(2) The relatively low cost of capital in the U.S. coupled with their high wage rates had led to the expectation of capital intensive specialization. This now famous paradox occurred again in a similar study by a pair of Japanese economists, Tatemoto and Ichimura.(3) In the case of Japan, theory would suggest a comparative advantage in labour, but the study indicated that Japanese exports as a whole were more capital intensive than domestic replacement of competitive imports. Japanese exports to the U.S. specifically were less capital intensive than total Japanese exports (75% of which went to underdeveloped countries in 1951), but were still more capital intensive than were U.S. exports to Japan.

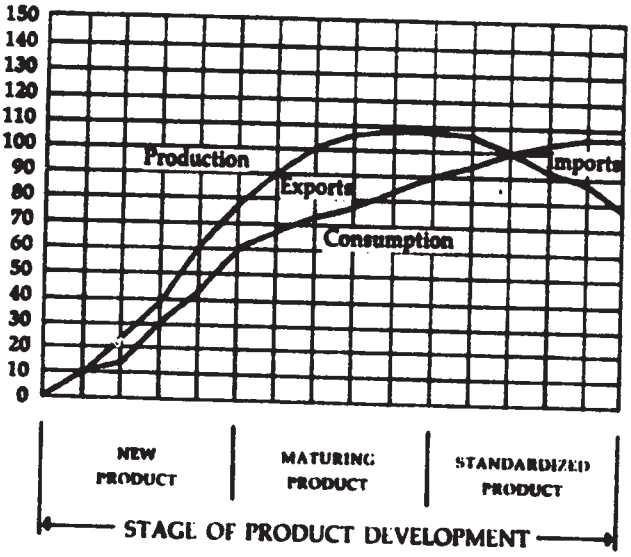
Explanations for these findings have been many and varied, but the net effect has been to point up some of the assumptions, implicit in the classical theory, which have long since ceased to be realistic. Chief among these are: 1. labour has equal skills between nations. 2. technology is widely shared, and 3. no economies of scale or size can be realized. And so explanations of the Leontief paradox have tended to stress the superior education level of U.S. labour, or the technological superiority of U.S. firms,

or the sheer size of the U.S. market. One popular explanation in defence of classical theory put forth by Leontief himself is that the high U.S. investment in education has rendered the U.S. labour force capital-intensive in and of itself.(4) Kreinin, however, found that U.S. labour was not sufficiently superior to make the U.S. labour abundant, and that part of the superiority was in any event due to U.S. managerial skills.(5) Unfortunately such explanations are little help to practising managers or government policy makers.

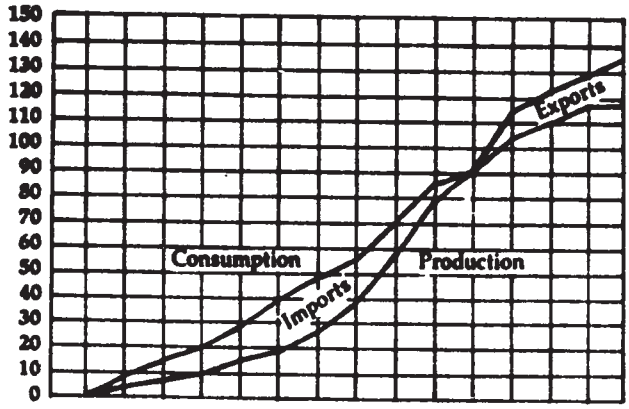
Innovation and Trade Theory

Not all economists have accepted the production cost emphasis of conventional theory. M.V. Posner in an article in 1961 (6) raised the point that comparative advantage - the production cost approach - was a static concept which measured at one point in time a moving phenomenon. His concern was with the process of generation of comparative advantage over time, which he discussed in terms of technological lags between nations. Raymond Vernon(7) subsequently developed a model of the export process from the time a new product is developed. The innovating nation rapidly becomes an exporter of the new product because of the technological lag in other countries. As the required technology becomes widely known and product design becomes more standardized, importing countries become more able to compete by manufacturing at home. The following charts

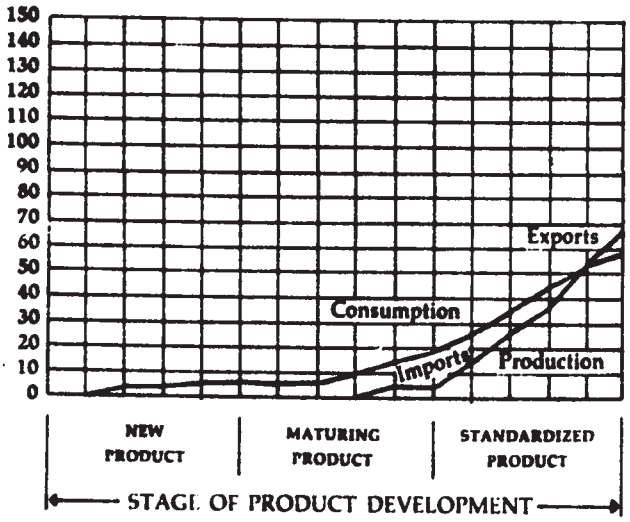
UNITED STATES




OTHER ADVANCED COUNTRIES




LESS DEVELOPED COUNTRIES



depict this process in greater detail.

Vernon further postulates that innovation, particularly of the consumer labour-saving kind (e.g., household appliances), is most likely to originate in the United States where a large high-income market prevails, risk capital is cheap and plentiful, and supplies of materials and components are readily available. In an unpublished doctoral thesis in 1967, Louis T. Wells Jr.[8] presented data which indicated a high correlation between improving U.S. export performance and high income elasticity for certain consumer durables. The large high income U.S. market clearly gives that country a competitive edge in the production of goods which appeal to high income families (e.g. dishwashers). If the product is one where economies of large scale production are significant it is difficult for other countries to compete effectively until domestic demand becomes large enough to warrant an economic production facility.

Considerable interest is being shown lately in the subject of competition by innovation. A. Keynes of The (London) Polytechnic's School of Management Studies recently published an article[9] challenging the British government's emphasis on a "prices and incomes policy" as a means of becoming more price competitive in international markets. "The simplified logic of this being: cut costs, cut prices,

capture the market." He then goes on to quote the work of G. C. Hufbauer, Posner, C. Freeman, S. Hirsch and Vernon to illustrate the importance of innovation rather than low prices as the "causal factor" in trade. Hufbauer published a study in 1966[10] which examined international trade flows in synthetic materials and disclosed convincing evidence of U.S. leadership in technology and hence in exports of synthetic materials despite high U.S. wage rates. Hufbauer discussed trade in two forms (a) technological gap trade dominated by innovative leaders and (b) low wage trade characterized by price competition and dominated by low-wage countries. Both Freeman[11] and Hirsch[12] published in 1965 studies of international trade in the electronics industry with similar results. Freeman states: "The U.S. has a very strong world lead in the production, export and use of computers and in almost all categories of electronic capital goods. Its share of world production of these goods was between 75% and 80% in 1963 and 1964".

Hirsch attempted to separate growth products from mature products in the electronics industry and examine the change in the U.S. balance of trade over several years in each classification. The following table clearly shows an increasingly favorable U.S. balance in growth products and an increasingly unfavorable balance in mature products.

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## U.S. BALANCE OF TRADE IN SELECTED ELECTRONIC PRODUCT GROUPS 1960-63

| | 1960 | 1961 | 1962 | 1963 | $ Million % Change 1960-63 |
|---|---|---|---|---|---|
| 'GROWTH' PRODUCTS | | | | | |
| Govt. and Industrial Products | | | | | |
| Exports | 202.9 | 249.9 | 336.9 | 338.7 | 67 |
| Imports | 13.2 | 17.4 | 38.0 | 41.4 | 214 |
| Balance | 189.7 | 232.5 | 298.9 | 297.3 | 57 |
| Special Purpose Tubes | | | | | |
| Exports | 21.6 | 22.0 | 24.1 | 25.9 | 20 |
| Imports | 2.4 | 3.8 | 3.4 | 4.5 | 88 |
| Balance | 19.2 | 18.2 | 20.7 | 21.4 | 11 |
| Components and Accessories | | | | | |
| Exports | 89.6 | 113.1 | 137.6 | 161.4 | 80 |
| Imports | 32.5 | 41.5 | 65.7 | 60.1 | 85 |
| Balance | 57.2 | 71.6 | 71.9 | 101.3 | 77 |
| 'MATURE' PRODUCTS | | | | | |
| Consumer Products | | | | | |
| Exports | 58.2 | 72.0 | 74.9 | 75.7 | 33 |
| Imports | 80.0 | 98.1 | 134.2 | 159.4 | 99 |
| Balance | -21.8 | -26.1 | -59.3 | -83.7 | -284 |
| Receiving Tubes | | | | | |
| Exports | 14.4 | 16.4 | 13.8 | 12.4 | -14 |
| Imports | 10.6 | 13.9 | 22.9 | 24.2 | 128 |
| Balance | 3.8 | 2.5 | -9.1 | -11.8 | - |
| ALL ELECTRONICS MANUFACTURES | | | | | |
| Exports | 408.8 | 494.9 | 603.5 | 624.1 | 53 |
| Imports | 138.7 | 174.8 | 264.3 | 289.7 | 109 |
| Balance | 269.3 | 319.9 | 339.2 | 334.4 | 24 |

Note: Growth products were separated from mature products according to the rate of increase in output (value added).

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Note: Growth products were separated from mature products according to the rate of increase in output (value added).

Some other findings related to this set of ideas are:

1. Wage rates tend to be higher in export-oriented industries. The ratio of production workers to total employees is relatively low.[13] This finding appears to be valid in Canada also.[14]
2. Expenditures on research and development in the U.S. are strongly correlated with export performance.[15]
3. Export-oriented industries are characterized by oligopolistic market structures, high in research and marketing expenditures and low in capital intensity.[13] The rate of innovation and the speed of adoption of new products or techniques are greater in larger firms.[16]

"These findings when drawn together paint a fairly consistent picture. They suggest the existence of national markets in which the economies of large scale and barriers to entry stem from the requirements of successful product innovation and successful marketing, rather than from capital intensity."[13] These findings also appear to offer an explanation for the Leontief paradox. It appears that U.S. industries tend to be net exporters of new and growth products and net importers of products which are late in their maturity and decline phases.[13] Since significant automation cannot usually take place until production technology and product design have stabilized and the market

has become more clearly defined, capital intensity is in fact associated more with mature products, and labour intensity, of the high skill variety, more with new products. Thus the innovative United States exports labour-intensive new products.

Much of the U.S. labour force consists of highly skilled, sophisticated "laborers". As has been pointed out, the ratio of production workers to total employees in U.S. export-oriented industries is low. Research, marketing and managerial skills are the most demanded in innovative firms, and organizational flexibility is paramount. It appears that wage rates are high in export-oriented industries because innovativeness demands high skills from ALL employees involved.(13) Therefore it might be claimed that the U.S. role as an innovator in international trade is entirely consistent with the strategic advantages of a large nation with high wage and education levels.

In a less theoretical vein, the French book "Le Defi Americain"(17) has become a best seller throughout Europe and has now been published in the U.S. The author, Jean-Jacques Servan-Schreiber, points up the American initiative in seizing opportunities created by the formation of the Common Market. He described American corporations "rolling from Naples to Amsterdam with the ease and speed of Israeli tanks in the Sinai desert." U.S.

technological and managerial skills are cited as reasons for U.S. domination of the most rapidly growing European industries, and he makes a plea for higher education levels for European youth and larger-sized European business units to compete with U.S. giants. Prime Minister Harold Wilson has said that "Europeans must not become 'the drawers of water and hewers of wood' for the U.S.[18] This reflects British concern for the plight a nation would face if it concentrated exclusively on price competitive "low wage trade" and failed to enter the "innovative trade" arena. It would confront generally hostile, undifferentiated, low margin industries characterized by spiralling downward pressure on costs and prices. Low wage trade might in fact respond substantially according to the classical trade theory of relative factor costs, except for the question of production economies of scale, and except for the continuous interruption of the status quo by displacing innovations from the technology leaders. It is this latter problem, the need to defend continuously against the leadership of innovating nations, and to face their using the low wage labour of other countries to make mature and declining products for themselves, which appears to concern Mr. Wilson.

## Innovation as Part of Marketing Strategy

Because economic theory has tended to deal mainly with homogeneous or undifferentiated products and with situations involving perfect knowledge, the whole area of mar-

keting has understandably been given little attention by economists. When competitive products are all viewed as essentially the same by consumers (e.g., electric ranges) and where information is a free good, then price becomes the only viable competitive weapon. This is one reason why, in mature product categories, prices are often forced down towards cost (e.g., electric ranges now sell at 70% of the price in 1953 and are reported to be generally unprofitable to firms in the industry in Canada). In these circumstances marketing tends to become synonymous with selling, and selling tends to consist of a bargaining process between manufacturers and dealers to reduce price via such means as volume discounts, lengthy credit, special package deals, discreet rebates to dealer salesmen, co-operative advertising and promotion. If these activities constitute marketing, why should marketing receive scholarly attention and what, if anything, does marketing have to do with innovation?

Alderson[19] has pointed out that product heterogeneity, diversified market segments, and imperfect information are the very essence of any theory of marketing. Marketing is not selling what people produce but seeking to understand what people need and want; then directing the manufacture of products that will fill those needs, and stimulating consumers to buy the products by appropriate methods of communication - advertising, promotion and distribution. In this context selling is only one part of

marketing. Recognition of consumer needs and related product research and development are critical factors. For example, the development and introduction of Johnson's "Pledge" spray wax followed an extensive two-part research program: first consumer research was done to determine important consumer preferences, then product research and development followed. By the time "Pledge" was ready for introduction much of the marketing had been done. Likewise in the appliance industry vast sums of money have been spent on research leading up to introduction of the self-cleaning oven. And perhaps even better known is the research that preceded the introduction of color television. This consumer-oriented research and product development is an integral part of the marketing philosophy or strategy of the firms involved.

Firms who fail to grasp this concept of marketing, or who cannot afford to adopt it, will either fail to do research and adopt the role of salesman, or will fail to channel the research they do into constructive avenues. It should be pointed out that special government programs to sponsor industrial research have generally provided firms with assistance in the area of "pure" research only. Expenditures on product development, market research, test marketing, and introductory advertising and promotion have been excluded from subsidy. To some extent the essential relationship of all these factors in the process of commercial innovation has been overlooked.

## The Canada - U.S. Situation

The emerging success of the European Common Market, plus the declining significance of Commonwealth preferences as tariff rates decline under the influence of Gatt, are forcing many Canadian businessmen to look toward some form of economic union with the United States. Already between 60%-70% of Canadian imports and exports are with the U.S. Raw materials and primary and semi-processed goods still constitute the bulk of Canadian exports, but an expanding secondary industry sector is emerging whose exports are slowly increasing as a percentage of total exports. The pressure on Canada to maintain a healthy trade surplus is increasing due to the high incidence of interest and dividend outflows to foreign (largely U.S.) investors. The Economic Council is looking to Canada's growing industrial sector to begin soon to narrow the huge trade deficit in manufactured goods.

The following DBS statistics indicate the trends in the composition and balance of Canadian Trade with the United States.

CANADA - U.S. TRADE FLOWS 1963 - 1968

1. Total Import-Export Figures

| | Canadian Imports from U.S. $ Millions | Canadian Exports to U.S. $ Millions | Balance of Trade $ Millions |
|---|---|---|---|
| 1963 | 4,445 | 3,766 | ( 679) |
| 4 | 5,164 | 4,271 | ( 893) |
| 5 | 6,045 | 4,840 | (1,205) |
| 6 | 7,136 | 6,028 | (1,108) |
| 7 | 8,016 | 7,079 | ( 937) |
| 8 | 9,057 | 8,892 | ( 165) |

2. Import - Export Figures for Manufactured Goods (End Products Inedible)

| | Canadian Imports from U.S. $ Millions | Canadian Exports to U.S. $ Millions | Balance of Trade $ Millions |
|---|---|---|---|
| 1963 | 2,533 | 425 | (2,108) |
| 4 | 2,955 | 643 | (2,312) |
| 5 | 3,579 | 846 | (2,733) |
| 6 | 4,452 | 1,626 | (2,826) |
| 7 | 5,324 | 2,589 | (2,735) |
| 8 | 6,253 | 3,595 | (2,658) |

3. Import - Export Figures on Autos and Parts

| | Canadian Imports $ Millions | | Canadian Exports $ Millions | | Balance of Trade $ Millions | |
|---|---|---|---|---|---|---|
| | Actual | Increase over Previous year | Actual | Increase over Previous year | Actual | Increase in deficit |
| 1963 | 581 | | 88 | | (493) | |
| 4 | 699 | 118 | 177 | 89 | (522) | ( 29) |
| 5 | 1,125 | 426 | 356 | 179 | (769) | (247) |
| 6 | 1,581 | 456 | 994 | 638 | (587) | 182 |
| 7 | 2,174 | 593 | 1,730 | 736 | (444) | 143 |
| 8 | 3,000 | 826 | 2,638 | 908 | (362) | 82 |

4. Manufactured Goods (End Products Inedible) as a Percentage of Total Imports and Exports

| | Canadian Imports from U.S. | | Canadian Exports to U.S. | |
|---|---|---|---|---|
| | Total | Excl.Auto | Total | Excl.Auto |
| 1963 | 57.0 | 44.0 | 11.3 | 8.9 |
| 4 | 57.2 | 43.7 | 15.1 | 10.9 |
| 5 | 59.2 | 40.6 | 17.5 | 10.1 |
| 6 | 62.4 | 40.5 | 27.0 | 10.5 |
| 7 | 66.4 | 39.4 | 36.6 | 12.1 |
| 8 (6 mos) | 69.9 | 35.9 | 40.5 | 10.8 |

5. Balance of trade deficit in manufactured goods with auto trade deleted - compared to growth in Canadian G.N.P.

| | Balance of trade | | G.N.P. | |
|---|---|---|---|---|
| | Actual Deficit | Index | Actual | Index |
| 1963 | 1,615 | 100.0 | 43,424 | 100.0 |
| 4 | 1,700 | 105.3 | 47,393 | 109.1 |
| 5 | 1,964 | 121.6 | 52,203 | 120.2 |
| 6 | 2,239 | 138.6 | 58,120 | 133.8 |
| 7 | 2,291 | 142.0 | 62,068 | 142.9 |
| 8 | 2,296 | 142.2 | | |

The total Canadian trade deficit with the United States had decreased to only $165 million by the end of 1968 from an annual total of $1.2 billion for 1965. However, the composition of Canadian imports from the U.S. is heavily weighted towards industrial end products (70% in 1968), while Canadian exports were 40% end products. Thus when one examines the end products sector alone, Canada's trade deficit with the U.S. in industrial goods was a huge $2.8 billion in 1966 and this figure is not declining. On the contrary, if trade in automobiles and parts is removed from both import and export statistics, on the assumption that such trade is now legislated and no longer responds to free competitive forces, then Canada's deficit in industrial goods is growing steadily at about the same rate as Canadian G.N.P.

In effect, Canada's export statistics are greatly enhanced by the negotiated effects of the Auto Pact. Over 60% of 1968 exports of industrial goods to the U.S. were automotive. When these figures are deleted, Canada's industrial exports are still only 15% of her total exports

to the U.S. Table 4 does show, however, a gradual increase over time in percentage of industrial goods to both total exports and total imports in Canada's trade with the U.S., even after the auto figures are removed. But it is clear that Canadian secondary industry shows no signs of significant improvement in its ability to compete in the free marketplace with U.S. competitors on their own soil.

The effect of the Auto Pact on our balance of payments seems to have given rise to a consideration of tariff reduction on a wider scale. This has led to a series of industry-by-industry studies by the Private Planning Association[20] and the Department of Industry. What has given some people pause, however, is (a) that the Auto Pact was a unique arrangement and does not represent the results of free trade at all, and (b) that Canadians may be selling their future for a relatively short term improvement in the balance of payments - where, as some people have argued, a deficit is not necessarily a bad thing anyway.

The approach currently being used in researching such issues is an amalgam of the work of several Canadian economists. First H. C. Eastman and S. Stykolt in an article entitled "The Performance of Two Protected Oligopolies in Canada"[2] examined the cement and oil refining industries from the standpoint of optimal plant

sizes for effective regional markets. They found that, because regional markets in the cement industry could sustain several optimal scale plants, Canadian operators could compete successfully with U.S. operators in terms of production costs. The reverse was found to be true in oil refining. It should be pointed out that these studies were largely production cost oriented and either overlooked marketing factors or chose industries in which marketing plays a very minor role. The fact remains that being <u>able</u> to produce at a cost equal to or lower than a competitor means nothing if you cannot sell the volume necessary to achieve your lower costs.

In his study entitled "Industrial Structure in Canada's International Competitive Position"[22] H. Edward English established the following major points about Canadian industry in general.

(a) Tariff barriers, while creating opportunities for the development of Canadian secondary industry, have insulated Canadian industries to too small a total market.

(b) Since U.S. manufacturers were the most aggressive in seizing these opportunities via the establishment of Canadian subsidiaries, many small scale plants emerged operating at high unit costs of production. English hypothesizes that the va-

rious subsidiaries saw one another as too powerful to eliminate, because of vast parent company resources, so that nobody attempted to build larger, more efficient plants for fear of prolonged reprisals if they captured too large a market share.

(c) Operating costs of these plants were increased by two other factors also: (1) diversity of production operations in most plants. (The small Canadian market meant shorter production runs and therefore more product lines required to keep a plant busy). (2) The payment of import tariffs on component parts and input materials.

(d) These conditions led to lower productivity of labour and a higher capital-output ratio (i.e., due to diversity and small scale of operations). Thus despite lower Canadian wage rates, costs of production were generally higher than in the U.S., and Canadian industry was sustained in its inefficiency by tariff barriers.

Again this mode of analysis focuses entirely on plant operating costs and tends to ignore problems of research, marketing and new product development.

Ronald J. and Paul Wonnacott in their study of "Free Trade Between Canada and the United States",[23] conclude that it is the tariff barrier that keeps Canadian industry relatively inefficient. "North American protection results in higher Canadian prices and costs because of three organizational factors: the size of the firm; the level of managerial efficiency necessary to survive; and oligopolistic opportunities offered by the protected market...the implication of this study is that this total effect is substantial in almost all industries."[23] (It has been suggested by some businessmen that this set of circumstances had led to some considerable ingenuity and imaginativeness on the part of Canadian managers trying to produce a multitude of products and models in small lots out of the same plant). The current inability of Canadian firms to match the production efficiency of their U.S. counterparts does not, however, deter the Wonnacotts from advocating free trade between Canada and the United States on purely economic grounds. One major point of their book is that trade flows under a tariff-free system cannot be estimated using cost of production data as it now stands. Free trade flows must be examined in the light of the costs that would exist under free trade; in Canada's case, free trade would pave the way for significant cost reductions in many industries. Canadian producers would begin to view the whole vast North American market as one, and would have to specialize in

chosen product lines to achieve the benefits of long production runs (now denied them due to in-plant diversity).

Although this would require substantial reorganization of plant facilities and personnel in many industries, and would demand a lot of capital at the outset, the medium term result would be a lower capital-output ratio, higher labour productivity and overall competitive costs. With the initial help of our lower wage levels, the Canadian firms would be able to compete in the United States, while U.S. firms with subsidiary companies would continue to produce in Canada. Of course, production rationalization would result in large increases in both imports and exports, but the net effect on Canada's trade deficit with the U.S. is expected to be favorable on the basis of production costs, transportation logistics and population concentration. Prices of many products would decline in Canada towards U.S. levels, just as wages would tend to rise over time, resulting in higher standards of living for Canadians. Even if the required reorganization and specialization failed to materialize quickly enough, and U.S. exporters outperformed Canadian producers in the early stages, it is felt that complete disaster would be prevented by an exchange rate adjustment. If the Canadian trade deficit with the U.S. increased too markedly, the Canadian dollar would be forced down and devaluation would provide a reprieve making Canadian goods cheaper to Americans and U.S. imports more expensive to Canadians.

The production rationalization approach to free trade would clearly work to the advantage of those firms with established marketing systems in both Canada and the United States. In this way it would clearly favor the large international corporations and would likely have an adverse effect on Canadian ownership of its industries. The approach also assumes that the main reason Canadian firms are not now exporting more to the United States is because Canadian production costs and therefore prices are too high. This assumption has more validity when applied to products whose demand is highly price sensitive than it does with differentiated products. It may well be more the lack of product advantage generally that holds us back, and the high risk and investment cost involved in developing the U.S. market.

A Marketing Viewpoint

The foregoing economic view represents an aggregate analytical approach to the problem, and the conclusions apply most strongly to those industries whose production costs are a high percentage and hence a major determinant of the selling price of their products. These tend to be the mature and declining product categories where most of the current volume is. However, such analysis is less relevant to product categories with high marketing or research costs, where price is not closely related to costs of production. These conditions tend to arise more with relatively new products

from which most of the future volume will come.

Many observers have pointed out that in business manufacturing costs cannot be the basis for calculating selling prices. Perfumes, soap products, cosmetics, processed foods, cigarettes, are just a few examples of product categories in which it often costs much more to research and market the product than it does to make it. Consumer demand characteristics in such purchases clearly reflect intangible factors in addition to physical product attributes. It is also clear that different brands of the same product can command different prices even though costs of production may be similar. Minor tangible product differences emphasized by effective advertising can become major determinants in consumer buying behavior. Product differentiation does not have to be physically tangible to tap a particular buying motive and add to consumer utility.

Innovation and the Life Cycle

The development and introduction of a new product is always unsettling to the established market equilibrium and invariably provokes a flurry of competitive activity. Successful new products pass through their uncertain introductory stage into a stage of rapid growth and over time through stages of maturity and decline. This concept of a life cycle implies that the market place is in a constant state of change according to the rate of innovation..

In the early states of a product's life, the emphasis of the firm is in research and product development and in marketing. There is generally little pressure on price on either the supply side (there is usually little direct competition at this stage) or the demand side, (the new product is generally differentiated in some significant way). A good deal has been written about the process of diffusion of innovation which suggests that early buyers of new products tend to be higher income and relatively undiscriminating in price. Leaders in the adoption of new trends appear to require a good deal of social prestige in order to be influential in communication.(24) From the standpoint of the firm, there appears to be some correlation between size and the rate of adoption of innovation. Larger firms adopt innovations more rapidly.(25) Production costs do not assume major importance in the early stages. As levels of competition increase and the product becomes more familiar to more consumers, prices are forced down towards production costs and emphasis is placed more on production economies. The maturity stage is therefore often accompanied by increasing levels of automation and heavy fixed investment costs, and survival through this and the decline phase becomes a matter of production engineering and low-cost distribution.

The life cycle concept leads directly to the conclusion that new product innovation, or at least rapid

imitation, is a critical competitive factor in growth industries. Once the maturity stage is reached in the life of a product, the degree of competition forces a switch in emphasis to skills of production engineering and distribution. If an innovating firm does not have the required production and distribution skills, it must either obtain them or develop new products, or both. The life cycle concept draws to the attention of firms (and countries) the fact that competitive life is not static, and thus emphasizes the need to recognize the aging of products and to adapt one's resources accordingly. If the exploitation of innovation is so critical to the survival of firms, in what conditions does it flourish? The answer seems to lie in the size of the firm's research and marketing organizations and its access to capital. It is evident that many consumer goods industries are characterized by oligopoly conditions. The U.S. food processing industry is such an example. Dominated by a few major firms with relatively low fixed equipment investment, the food processing industry has produced a steady stream of new products at an accelerating rate since the late 1940's. The average industry unit cost of production has been declining steadily as a percentage of selling price, and interestingly enough, this is not due to rising prices. Expenditures on research (including marketing research) are high, as are expenditures on advertising and promotion, particularly for new product introductions.

It is the size of the research and marketing expenditure that are necessary to remain competitive which constitutes the barrier to entry and reinforces oligopoly conditions of a most competitive variety. Buzzell and Nourse draw a number of interesting conclusions about the above information in their study of product innovation in food processing,[26] including the following:

1. Marketing costs are very high during the first year of regular distribution, averaging 43% of sales.

2. Approximately 40% of new product introductions failed, some of these despite heavy promotional expenditures.

3. For the ten year period 1954-1964 new items accounted for about two-thirds of 1964 sales.

4. Large firms usually have distinct advantages in new product development because of (a) economies of scale in R & D, (b) the ability to spread risks and (c) the opportunity to exploit the results of R & D on a larger scale through access to national markets.

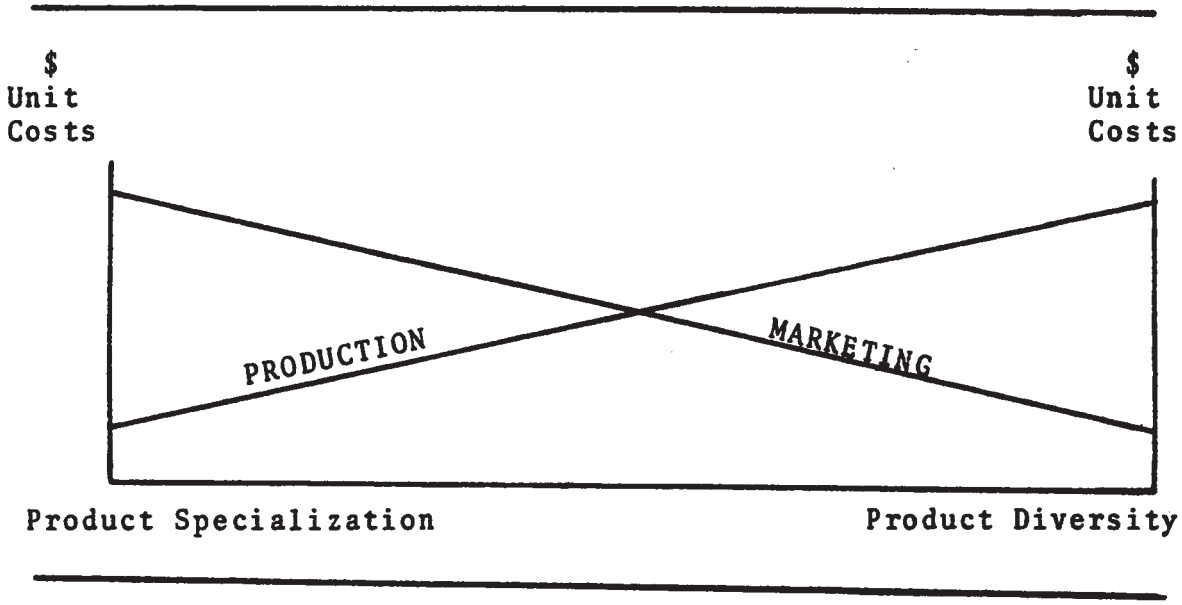
5. Higher product prices in the early period of product introduction constitute a reward to the innovator who paves the way for subsequent price competition by imitators.

The presence of marketing barriers to entry has received little attention from economists until recently, but such barriers are clearly significant in industries where unit marketing costs are high. A most notable example of concern over the power of the large marketing organization occurred in late 1963 when the U.S. Federal Trade Commission ordered Procter and Gamble to divest itself of its interest in Clorox.(27) The Clorox share of the liquid bleach market was over 50% and growing when Procter and Gamble took it over. The F.T.C. felt that P & G posed a threat to the survival of competition in the liquid bleach market by virtue of its marketing proficiency and resources and its power to negotiate advertising rate reductions.

The large oligopoly firms in consumer goods industries generally are characterized by huge marketing organizations with extensive geographical reach. Examples are firms like Procter and Gamble and General Foods (listed as 27 and 40 respectively in Fortune's list of "500 largest U.S. industrial corporations") or Unilever and Nestle (listed as 2 and 11 respectively in Fortune's "200 largest industrials outside the U.S."). These are firms whose competitive strategies are market oriented, and their entire organizations including research and production are coordinated for the accomplishment of these marketing strategies. They can introduce a new product across all of North America in the same week if they desire, or go world-

wide in a very short space of time. They have the sales force, the distribution channels and warehouse facilities, coverage of the retail outlets and a high skill with complex co-ordinated marketing programs. This heavy fixed commitment to the marketing organization reduces the marginal cost of each related new product introduction, which improves the climate for risk taking innovation. These marketing giants also gain the advantage of advertising rate reductions as frequent users of media. Their diversity of product lines also provides an opportunity to share the benefits of advertising among more products via a single unifying theme (e.g., "Another fine product of General Foods"). As well as reducing the unit cost of advertising, this approach builds an identity for the mother firm in which consumers develop confidence over time. This confidence in turn engenders a willingness to try new products when they are introduced by a known supplier.(28) Thus the marketing oligopoly represents the ideal climate for new product introductions, whether they be original innovations or rapid adoptions. The following chart depicts in crude form the relative behavior of marketing costs and production costs, along the continuum from specialization to diversity.

All this is to suggest two things. First, that commercial innovation - the source of tomorrow's mature products - is fostered best in a large, high income market by large firms. Free trade with the United States would




provide Canadians with the "large, high income market", and thus may be viewed as a necessary but not sufficient stimulus to increased business innovations by Canadians. It would remain for Canadians to develop the large firms, or find some way of replicating their critical advantages. Second, that there are marketing economies of scale and diversity which to the small Canadian firm cause high investment barriers to entry into the United States market, and tend to offset the production cost savings which might come from specialization. The importance of these two factors is highest where marketing and research costs constitute a large fraction of a product's selling price, and diminishes as selling price falls closer to costs of production. The life cycle concept suggests that these two marketing factors are most important in the introductory and growth stages of a product's life.

The question may be raised whether large, marketing oriented, oligopoly firms of the type described above are, in fact, major exporters of consumer products with high marketing costs. It appears that the transfer of the kinds of skills these firms possess is most effectively achieved via the establishment of subsidiary operations, and that they are disposed to follow the direct investment route to foreign markets.(29) Thus the level of trade flows in packaged consumer goods is not in itself indicative of the power of the large marketing firms in international markets. One must also consider patterns of direct investment.

It should be pointed out that the essential power of the large marketing organization consists of its control over the distribution and sale of its products, through many levels of distribution, to the consumer. This consumer franchise gives the organization bargaining power with distributors and retailers etc., and provides the stability and confidence required to proceed with major co-ordinated marketing programs. Galbraith refers frequently to this producer power over markets in his book, The New Industrial State.(30) In contrast, many Canadian firms attempting to sell consumer goods in the United States find themselves at the mercy of the channels of distribution. Because they lack a strong consumer franchise, they sell to only one or two major U.S. department store chains, or they engage a U.S. distributor to handle the line along with many others he carries. In

either case most Canadian firms have little or no control over their marketing activities in the U.S. With little real power over distribution practices, it is of course foolish for Canadian firms to make the substantial investment required in direct consumer advertising in the United States. One does not make a costly investment of this kind when distribution is spotty and subject to total cancellation at the decision of someone outside one's span of control. The result is a vicious circle in which Canadian firms generally do not market as such at all in the U.S.; they simply sell where they can on a here-and-now basis. The development of a permanent and growing demand for Canadian consumer goods in the United States awaits the willingness of Canadian firms to invest substantially in an integrated marketing program to promote consumer prefernce and buy the co-operation of U.S. channels of distribution through advertising and direct selling - a costly proposition indeed!

# BIBLIOGRAPHY

(1) Haberler, Gottfried, "A Survey of International Trade Theory", Princeton University, 1955.

(2) Leontief, Wassily, "Domestic Production and Foreign Trade, The American Capital Position Re-examined", Proceedings Am. Philosophical Soc. 97 (4) pp. 332-49.

(3) Tatemoto & Ichimura, "Factor Proportions and Foreign Trade - the Case of Japan", Review of Economics and Statistics, October, 1959, pp. 442-6.

(4) Leontief, Wassily, "Factor Proportions and the Structure of American Trade, Further Theoretical and Empirical Analysis", Rev. Econ. Stat., November, 1956, pp. 386-407.

(5) Kreinin, Mordechai E., "Comparative Labour Effectiveness and the Leontief Scarce Factor Paradox", American Economic Review, March, 1965, pp. 131-39.

(6) Posner, M. V., "International Trade and Technical Change", Oxford Economic Papers, Vol. 13, October, 1961.

(7) Vernon, Raymond, "International Investment and Inter-National Trade in the Product Cycle", Quarterly Journal of Economics, May, 1966.

(8) Wells. Louis T. Jr., "Product Innovation and Directions of International Trade", Unpublished doctoral thesis, Harvard Business School, 1967.

(9) Keynes, A., "Competition by Innovation", District Bank Review, June, 1968 (Manchester, England).

(10) Hufbauer, G. C., "Synthetic Materials and the Theory of International Trade", Harvard University Press, 1966.

(11) Freeman, C., "Research and Development in Electronic Capital Goods", Economic Review, November, 1965.

(12) Hirsch, Seev, "The U.S. Electronics Industry in International Trade", Economic Review, November, 1965.

(13) Gruba, William, Dileep Mehta and Raymond Vernon, "The R & D Factor in International Trade and International Investment of United States Industries", Journal of Political Economy, February, 1967.

(14) Wilkinson, Bruce, "Canada's International Trade: An Analysis of Recent Trends and Patterns", Private Planning Association, 1968.

(15) Keesing, Donald B., "The Impact of R & D on U.S. Trade", Journal of Political Economy, February, 1967.

(16) Mansfield, Edwin, "The Speed of Response of Firms to New Techniques", Quarterly Journal of Economics, May, 1963.

(17) Servan-Schreiber, Jean Jacques, "The American Challenge", forthcoming U.S. translation.

(18) Fortune Magazine, September, 1968, p. 165.

(19) Private Planning Association 1968, "Trade Liberalization and (a) Canadian Agriculture, (b) The Canadian Pulp and Paper Industry, (c) The Mineral Industries, (d) The Canadian Steel Industry, (e) The Canadian Primary Textiles Industry, (f) The Canadian Furniture Industry, (g) The British Columbia and Atlantic Economics".

(20) Alderson, Wroe, "Dynamic Marketing Behavior", R. D. Irwin, 1965: Chapter 1.

(21) Eastman, H. C. and S. Stykolt, "The Tariff and Competition in Canada", Macmillan, 1967.

(22) English, H. Edward, "Industrial Structure in Canada's International Competitive Position", Private Planning Association.

(23) Wonnacott, Ronald J. and Paul, "Free Trade Between The United States and Canada", Harvard University Press, 1967.

(24) Rogers, Everett M., "Diffusion of Innovations", New York, Free Press of Glencoe, 1967.

(25) Mansfield, Edwin, "The Speed of Response of Firms to New Techniques, Quarterly Journal of Economics, May, 1963.

(26) Buzzeli, Robert D and Robert E. M. Nourse, "Product Innovation in Food Processing 1954-1964", Graduate School of Business Administration, Harvard University, 1967.

(27) Business Week, December 21, 1963.

(28) For evidence of the power of national brands to command loyalty across product types, see Joseph N. Fry, "Family Branding and Consumer Brand Choice", Journal of Marketing Research, August, 1967.

(29) Caves, Richard E., "Foreign Investment, Trade and Industrial Growth", The Royer Lectures, University of California, Berkeley, December 1-2, 1969, (mimeographed)

(30) Galbraith, John Kenneth, "The New Industrial State", Houghton-Mifflin Company, Boston, 1967.

## CHAPTER III

## THE INTERDEPENDENCE OF GOODS AND CAPITAL IN TRADE FLOWS

Conventional economic theory appears to have maintained a wide distinction between what causes imports and exports of goods and what causes imports and exports of capital. Capital, it is held, flows between countries according to relative interest rates while goods flow according to comparative advantage. This distinction between capital flows and goods flows is further perpetuated by the distinctly separate means of measuring each of these phenomena. The national metering devices are separate and the theory seems to be oriented around them.

The past two decades have seen a significant change in the composition of capital flows as between direct investment, portfolio investment and other debt capital. Direct investment has become an increasingly large percentage of total capital flows. This is particularly noteworthy in the case of U.S. investment in Canada and Europe. A study by the National Industrial Conference Board entitled, U.S.

Production Abroad and the Balance of Payments[1] indicated that the book value of U.S. direct foreign investment in 1965 had reached a cumulative total of $50 billion and was probably responsible for annual sales exceeding $100 billion out of foreign production. These figures greatly overshadow export performance as the following table demonstrates:

It should be pointed out that the investment figures shown above are cumulative while the export figures are, of course, annual data. At the same time the investment figures are given at book value which is thought to be considerably below their current market value. However, the point to be made is that the annual sales generated abroad by these foreign investments do greatly exceed the annual exports, and that for many U.S. firms foreign investment is a key method of responding to foreign demand. It is also noteworthy that growth in foreign investment and growth in exports have gone hand in hand, as investment abroad apparently stimulates exports in other goods to make up for those exports displaced by foreign production. It seems that the returns from international trade are now achieved more from the export of capital into foreign production than from the export of goods.

By 1963 over $26 billion had been invested in Canada by foreigners and 59% of this was in the form of direct investment largely from the United States. The following table taken from the book, Foreign Ownership of Canadian

## GROWTH OF U.S. EXPORTS AND DIRECT INVESTMENT

| | 1950 ($ million) | | 1964 ($ million) | | Annual Growth (per cent) | |
|---|---|---|---|---|---|---|
| | U.S. Exports to | U.S. Investment in (book value) | U.S. Exports to | U.S. Investment in (book value) | Exports | Investment |
| Europe | 3,116 | 1,733 | 8,588 | 12,067 | 7.9 | 13.8 |
| Canada | 2,011 | 3,579 | 4,767 | 13,820 | 6.4 | 11.1 |
| Latin America | 2,718 | 4,445 | 3,786 | 8,932 | 2.4 | 5.1 |
| Other | 2,272 | 2,031 | 8,147 | 9,524 | 9.0 | 11.7 |
| Total | 10,117 | 11,788 | 25,288 | 44,343 | 6.8 | 9.9 |

Source: U.S. Department of Commerce

## FOREIGN LONG-TERM CAPITAL INVESTED IN CANADA

Selected Year-Ends 1900-63

| Year | Total ($ billions) | Direct Investment as % of total | U.S. as % of total | Total as % of gross national product in current dollars |
|---|---|---|---|---|
| 1900 | 1.2 | - | 14 | - |
| 1913 | 3.5 | 23 | 22 | - |
| 1926 | 6.0 | 30 | 53 | 117 |
| 1930 | 7.6 | 32 | 61 | 133 |
| 1939 | 6.9 | 33 | 60 | 123 |
| 1945 | 7.1 | 38 | 70 | 60 |
| 1948 | 7.5 | 44 | 74 | 50 |
| 1957 | 17.5 | 58 | 76 | 55 |
| 1961 | 23.6 | 58 | 76 | 63 |
| 1963 | 26.2 | 59 | 78 | 61 |

Industry, by A. E. Safarian[2] shows the increasing size of direct investment over time.

Of course, one result of such extensive direct investment by foreigners into Canada is the heavy incidence of foreign ownership and control of Canadian based industries, and the associated uneasiness over the size of the "debt" and the future problem of servicing it via repatriated dividends, royalties, management fees, etc. However, as Robert W. Knapp stated in his dissertation, United States Direct Investment in Canada, 1950-60,[3] direct investment is a mutually beneficial process. These concerns must, therefore, be measured against the benefits to the country receiving direct investment. Amongst these benefits the most commonly mentioned are greater employment in the borrowing country, higher tax receipts for the government and the encouragement of local suppliers. However, along with these are some very important intangible factors including technical know-how and managerial skills. In an article on the benefits of direct investment, John M. Hunter summed up with these words: "Long term, direct investment is a 'package deal' and the essential elements of the package are: an increment of foreign exchange, technical know-how, risk bearing, and entrepreneurship".[4] Or as Raymond Mikesell put it: "The private investor from an industrially advanced country not only brings with him capital, technology, and managerial experience, but he introduces new business

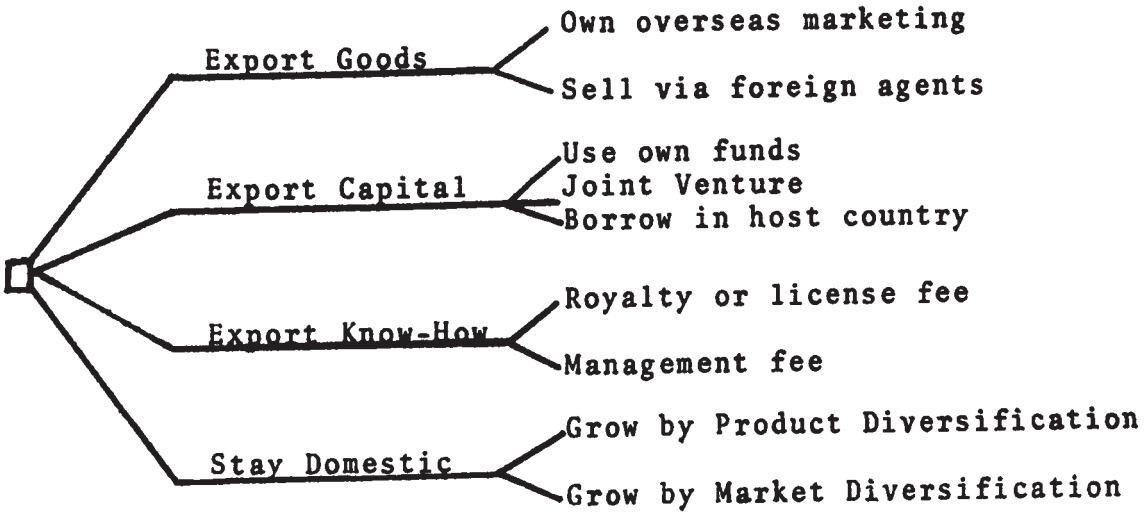
concepts which help to revolutionize the thinking and practice of the area".[5] Not the least of these concepts is long range planning and investing for future growth.

The benefits of receiving foreign direct investment may be considerable and it would seem short-sighted for Canadians to try to eliminate them for balance of payments purposes, especially in new industries where technology and innovation are in a state of rapid flux. It is also clear from the foregoing that "direct investment" capital flows are not motivated solely or even primarily by differential interest rates. The investment decision is much more complex, and involves the interrelationship between exports, direct and indirect methods of investment. What is clear is that, when it comes to direct investment, it is <u>firms</u> that do the investing, not countries. And to understand what causes direct foreign investment one must examine the decision alternatives facing the firm and not simply examine aggregate international flows.

From the standpoint of the firm viewing foreign countries as possible markets for industrial products direct investment abroad clearly constitutes an alternative strategy to the export of goods. In choosing whether to compete in a foreign market by investment or by exports, a firm faces a decision situation similar to the conventional "make or buy" decision. The factors involved differ, how-

ever. The decision to follow the export route would be supported by such factors as production scale economies in the domestic market, low risk of capital loss at home, and technological sophistication and uniqueness of product. Opposing factors would be tariffs and other trade barriers, exchange and other risks, the threat of locally-based competition and the desire for an image of permanency in the host country. A third possible strategy when product-based technology is involved, would be to license an overseas producer to manufacture the product in return for a royalty- in other words, to export know-how. The following diagram attempts to capture the parameters of the decision situation facing the firm:

Alternative Approaches to International Trade




It is quite clear that, where a big enough market is judged to exist for a given product, high tariff barriers in a foreign country favour the investment of capital there

instead of the export of goods from the originating firm, by making it difficult for would-be exporters to compete in the host country. The removal of tariffs and other forms of trade barrier would speed up trade in goods and reduce direct foreign investment. Thus a host country must choose when it determines its policy on trade barriers whether it is preferable to have foreign capital and/or control, or foreign goods imports. Countries struggling to develop higher levels of domestic employment and more diversified secondary industry will usually opt for the benefits of foreign direct investment and erect appropriate trade barriers.

The foreign investment decision process is, however, a much more complex phenomenon than the previous discussion has suggested. In his book The Foreign Investment Decision Process,(6) Yair Aharoni has made the point that, for domestic firms making their first excursion into foreign markets, the cost and effort required to obtain information about other countries is itself a major deterrent. The selection of a country to trade with is seldom "rationally" made. Familiarity with the market and proximity are two frequent criteria, and the whole question of foreign investment is often decided by the power and persistence of one executive in the organization.

Having made the first successful foreign investment, firms, according to Aharoni, are relatively easily con-

vinced to reinvest retained earnings - a fact which balance of payments figures do not reflect. And this growth in foreign equity via foreign profits may result later in dividends that are very high in relation to the original capital investment. It is also pointed out in the N.I.C.B. study previously cited that most U.S. firms planning foreign investment tend to borrow as much as possible from the host country and to minimize investment of U.S. dollars (sometimes replacing them by equipment or inventory). Where this course is followed, it is clear that foreign investment may take place without the export of funds at all. In fact, as Kindleberger states, "it runs the risk of creating a transfer problem in reverse".(7)

The question of what causes direct foreign investment and how it affects the balance of payments of the investing and receiving countries is fraught with difficulties of measurement and concept. In 1965 the U.S. government instituted a voluntary restraints program on U.S. direct investment abroad and called on the multi-national giants to speed up repatriation of capital to ease the U.S. balance of payments problem. The government's request appeared to be based on incremental investment theory which holds that each investment decision is evaluated according to the incremental profit it will generate. Officials apparently believed that U.S. firms invested abroad because the rate of return was higher than that from investing at home, and that

the restraints program would cost only the differential in the two rates of profit. However, in the National Industrial Conference Board study,[1] the government's program was challenged. The authors held that in many cases the firm's decision to invest abroad was "organic" by nature, i.e., designed to preserve total foreign market share and the earnings stream as a whole, and that in most firms, marketing strategy dominated company investment decisions. In many cases foreign investment was made because the host country intended to erect trade barriers to halt the import of goods, and the exporter switched to foreign production to preserve the market he had developed.

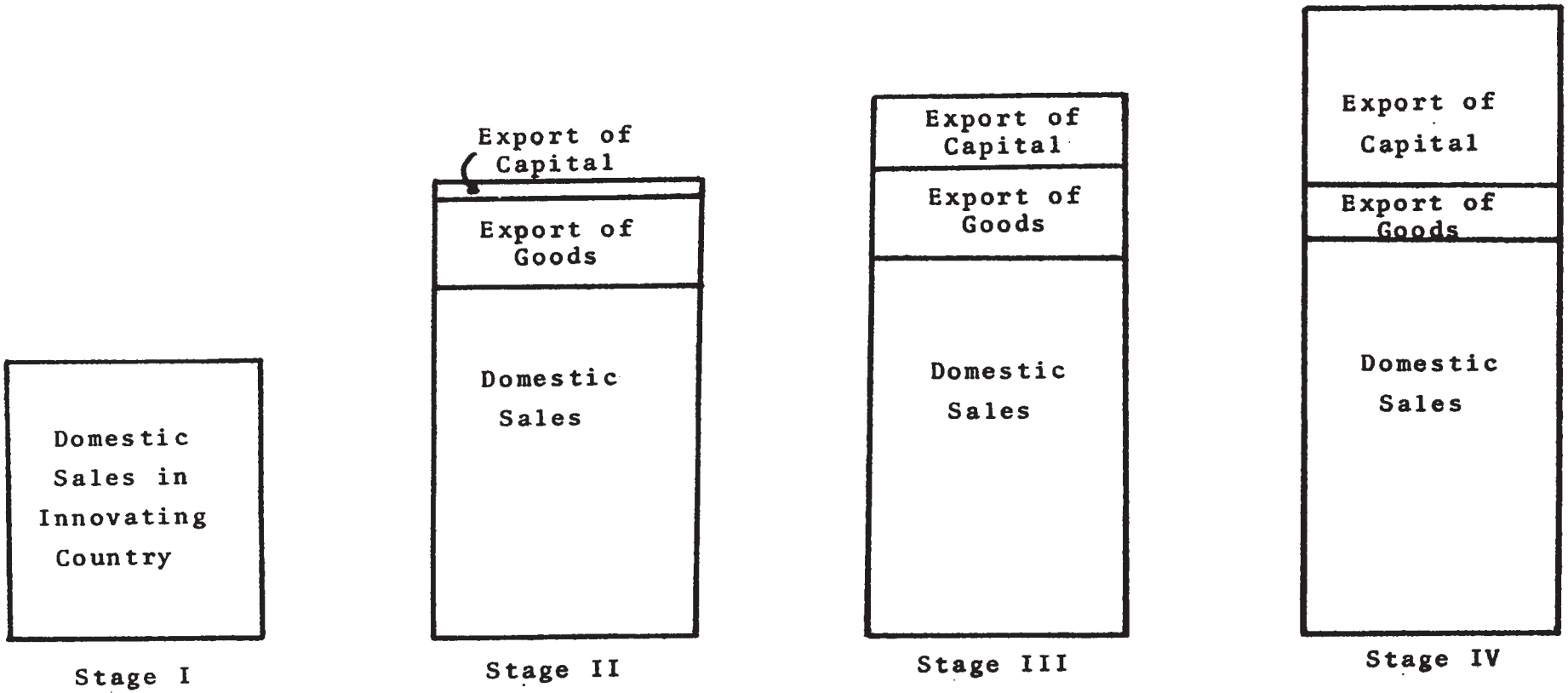
In trying to derive some meaningful pattern from the foregoing studies which might help to explain the flow of direct investment capital it is useful to view the problem in the light of the various stages in the product life cycle view of trade. "The speed with which a new innovation reaches international markets will be influenced by the global marketing contacts of the innovating firm and the emergence of demand in various countries or markets. Where the emergence of foreign demand precedes the innovators export marketing efforts, it is expected that entrepreneurs in the importing country will function as catalysts in the flow of goods. But either way it is expected, in the early stages of a product's life, that foreign markets will be served essentially by the export of goods. Direct investment flows are expected to be restricted to warehousing and marketing activity, and then only when the innovating firm functions as the catalyst in foreign trade."

The success of export activities gives rise to the possibility of competition from within importing countries as the product matures from the innovator's point of view. Coupled with the threat of tariff protection, the combined result tends to be a greater propensity for the exporting firm to invest abroad both in production and in marketing facilities to protect its foreign markets. Such an investment displaces exports of the finished product, but opens up possibilities for export of component parts of subassemblies and the export of other "related" products that the exporting firm handles at home. Thus at this stage, export of goods and capital go hand in hand. As foreign manufacturing facilities become more integrated, often in response to competition from local manufacturers, overseas capital commitments increase and complementary exports decline.

At this stage a good deal of the additional foreign investment never appears on the balance of payments ledger. It takes many forms which do not appear in the national accounts, such as; the reinvestment of retained earnings; the reduction of royalties and management fees; and the postponing of payment for goods traded between parent and subsidiary. Also as firms become more multi-national in scope, the directing of capital transfers between countries is influenced more by national taxation policies and exchange stability.

The following diagram attempts to depict this hypothesized relationship between exports of goods and capital during the life cycle. The diagram is based on the assumption of a large domestic demand for the product in the innovating country (e.g. United States) and more gradual emergence of demand elsewhere. The relative size of the boxes may differ as these assumptions are varied.

In summary, there is an increasing tendency for U.S. firms to respond to foreign demand by direct investment usually involving control of foreign manufacturing and marketing operations. This has been particularly noticeable in Canada. There are many benefits to the receiving country associated with direct investment, including technological and managerial know-how, which must be balanced against the costs of lost control. From the standpoint of the foreign investor, the decision situation is one in which direct investment is normally one of several possible solutions, and the investment climate therefore can have a marked effect on the level of direct investment. Finally it was suggested that the conditions which encouraged a firm to move to direct investment abroad emerged more in the later stages of the product life cycle; whereas the benefits of direct investment to the receiving country were greatest in the introductory stages of the cycle. (i.e., technological and managerial know-how are more critical at the stage of new product introduction).




Hypothetical Pattern of
Exports of Goods And Capital In The Product Life Cycle

(1) Polk, Judd, Irene W. Meister and Lawrence A. Veit, "U.S. Production Abroad and the Balance of Payments", National Industrial Conference Board, 1966.

(2) Safarian, A. E., "Foreign Ownership of Canadian Industry", McGraw-Hill, 1966.

(3) Knapp, Robert Whelan, "United States Direct Investment in Canada, 1950-1960", University of Michigan, 1963.

(4) Hunter, John M., "Long-Term Foreign Investment and Underdeveloped Countries", Journal of Political Economy, Vol. VXI (February, 1963), pp. 15-24.

(5) Mikesell, Raymond, "Promoting United States Private Investment Abroad", Washington, D.C., National Planning Association, 1957.

(6) Aharoni, Yair, "The Foreign Investment Decision Process", Division of Research, Harvard Business School, 1966.

(7) Kindleberger, Charles P., "International Economics", Homewood, Illinois, Richard D. Irwin, Inc., 1963. Chapter 20, p. 407.

# CHAPTER IV

## RESEARCH DESIGN

The research which is reported in the following chapters was designed to test the Vernon hypothesis of innovation as a causal factor in trade flows between Canada and the U.S. As such it concentrated on the process by which new products were introduced to the Canadian consumer and emphasized marketing and research considerations as well as production costs. It was felt that if the Vernon hypothesis were supported by data on Canada - U.S. trade, then we would gain a better understanding of the continually shifting composition of the flows of goods between the two countries, and hence a greater ability to predict the direction of change over time.

The innovation theory suggests that in the early stages of a product's development, Canada would be a net importer from the U.S. This follows from the existence in the U.S. of a large high income market and large marketing oriented firms heavily committed to research and innovation. New products are much more likely to originate

first in the United States and flow to Canada as imports until Canadian sales become large enough to warrant domestic manufacture. As the product matures, the ratio of imports to domestic sales can be expected to decline. Because of the heavy incidence of U.S. subsidiaries in Canada, and relatively high incomes in this country, it is expected that successful new products in the U.S. will reach Canada quickly as imports, and that they will be manufactured here by subsidiaries before independent Canadian firms manufacture. The process hypothesized is as follows:

| | |
|---|---|
| STAGE 1 | U.S. INNOVATION SUCCESSFULLY INTRODUCED AT HOME |
| STAGE 2 | FINISHED PRODUCT EXPORTED TO CANADA VIA SUBSIDIARY COMPANY MARKETING SYSTEMS |
| STAGE 3 | CANADIAN SUBSIDIARIES ASSEMBLE, THEN INTEGRATE PRODUCTION OPERATIONS IN CANADA AND GRADUALLY INCREASE CANADIAN COMPONENT CONTENT |
| STAGE 4 | CANADIAN OWNED FIRMS BEGIN PRODUCTION OF THE NEW PRODUCT |
| STAGE 5 | PRODUCTION BECOMES INCREASINGLY AUTOMATED OVER TIME AS THE PRODUCT MATURES AND THE MARKET BECOMES MORE WELL-DEFINED. SOME EXPORTING BACK TO INNOVATING COUNTRY. |

This process would suggest the following relationships as the stages of new product introduction are accom-

plished.

STAGE 1-2 INTRODUCTION OF NEW PRODUCT

Ratio of finished product imports from innovating country to domestic consumption at highest level.

Ratio of unit production cost to factory selling price at lowest level.

Rate of capital investment at lowest level.

Ratio of component parts imports from innovating country to domestic consumption at lowest level.

STAGE 3 GROWTH OF NEW PRODUCT SALES IN CANADA

Ratio of finished product imports from innovating country to domestic consumption declines from introductory stage.

Ratio of unit production cost to factory selling price increases from introductory stage.

Rate of capital investment increases from introductory stage.

Ratio of component parts imports from innovating country to domestic consumption increases from introductory stage.

STAGE 4-5 MATURITY AND DECLINE OF "NEW PRODUCT" SALES IN CANADA

Ratio of finished product imports from innovating

country to domestic consumption declines to lowest level.

Ratio of unit production cost to factory selling price increases to highest level.

Rate of capital investment increases to highest level.

Ratio of component parts imports from innovating country to domestic consumption decreases from growth stage.

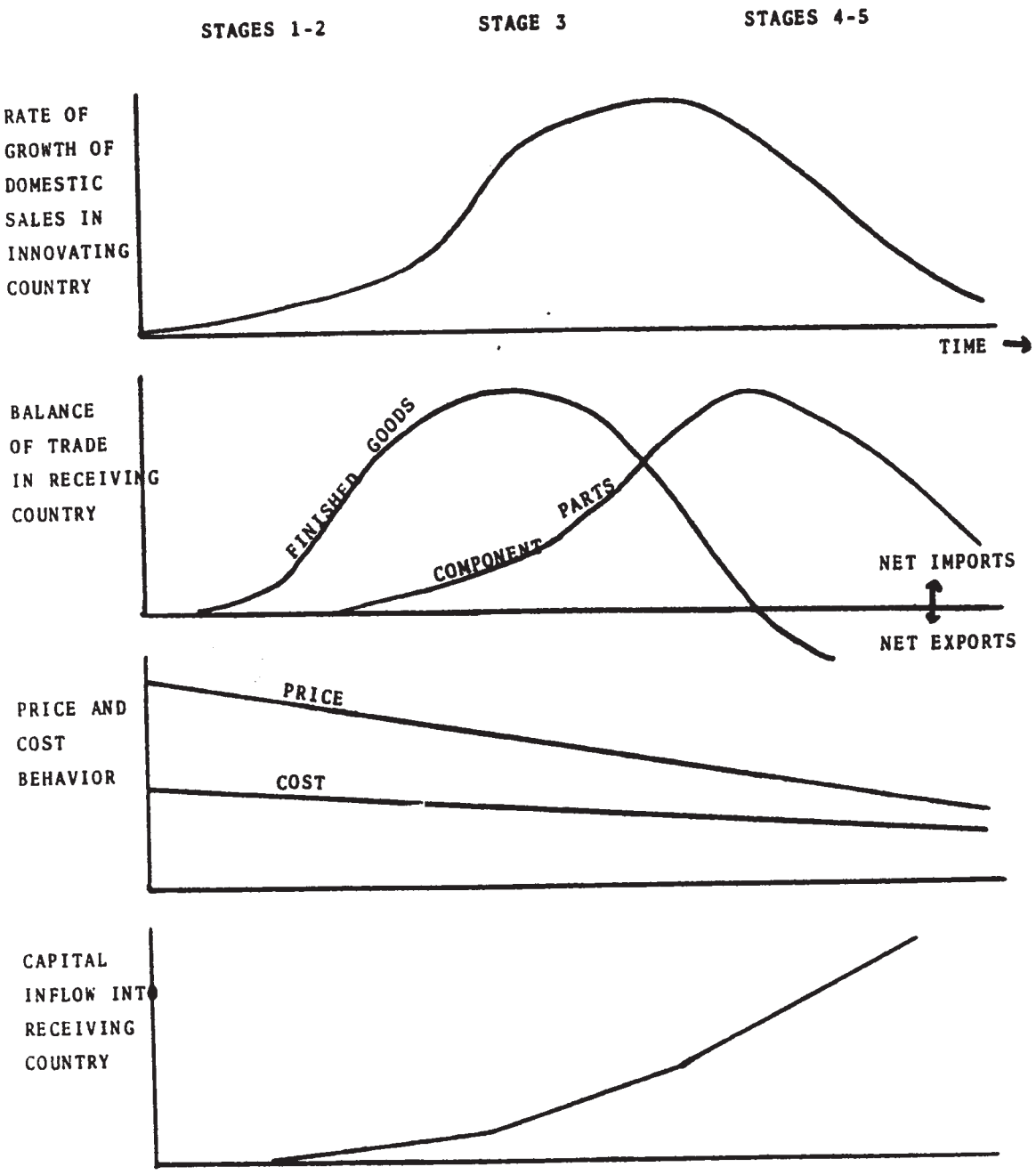
These hypothesized relationships are depicted graphically on the following page.

Before testing the foregoing relationships an attempt was made to define what should constitute a stage in the life cycle of a product. It was intended to test the direction of change of the ratios as the products passed from one stage to the next. It was also necessary to define the method of measuring the two elements of each ratio, and the method of selection of products for testing.

1. Definition of Stages in the Cycle.

The life cycle concept is normally discussed in terms of the consumption curve of the product under study. The logic underlying it is that sales of new products will pass through the familiar S shaped growth curve as they

IMPACT OF THE STAGES OF THE PRODUCT LIFE CYCLE



struggle to gain consumer acceptance.[1] Competitive activity is expected to increase as the sales of a product embark on the rapid growth stage, and this is expected to bring about price reductions which continue throughout the cycle. Of course, price reductions can continue only up to a point. If costs increase in spite of increased volume (i.e., higher factor costs), prices may not be able to decline and may even rise, but it is expected that increased competitive activity will bring about a decline in gross margins.

The length of the life cycle will, of course, vary by product, and stages will not last for the same number of years. Since the stages had to be defined in terms independent of the variables being tested, it was originally decided to use rate of growth in consumption as the determining criterion. Robert B. Stobaugh Jr., in an unpublished doctoral thesis entitled, "The Product Life Cycle, U.S. Exports, and International Investment",[2] used the following method of defining stages in the life cycle.

STAGE I GROWTH RATE OF CONSUMPTION 20% or more

STAGE II GROWTH RATE OF CONSUMPTION 7% to 20%

STAGE III GROWTH RATE OF CONSUMPTION 0% to 7%

STAGE IV GROWTH RATE OF CONSUMPTION less than 0%

Stobaugh attempted to normalize actual consumption figures by dividing each year by that year's gross national product expressed in constant (1958) dollars. Thus a product whose sales growth just kept pace with population or income growth had a zero growth rate after normalization. As it turned out in Stobaugh's study, Stage IV was never used as none of his products reached a decline stage in consumption.

The consumption curves of most products are seldom smooth, and a product may not necessarily pass into Stage II the first year its sales growth is less than 20%. Stobaugh was obliged to smooth the consumption curve by eye and observe longer term changes in direction when establishing cut-off years for the life cycle stages. Then in retrospect the average annual growth rate for each stage fell within the range established above. An attempt to use a similar approach with the data in the following chapters proved unproductive. Canadian consumption patterns for most of the products examined were so erratic that sequential stages with declining annual growth rates in consumption were impossible to determine for many products. Since the hypothesized trends in the pertinent ratios appeared to be occurring anyway, it was decided eventually to measure them over sequential four year time periods, as illustrated in chapter XVI.

2. Measurement of Variables

a. Ratio of finished goods imports to domestic consumption:

It was expected that in most cases the United States would be the innovating nation, so it was decided to measure the imports of each product from the United States in units. This was to be expressed as a fraction of Canadian sales of that product in units by year to observe the pattern of the ratio over time. For purposes of testing, a weighted average ratio was calculated for each sequential time period and the actual direction of change compared against the hypothesized downward direction.

b. Ratio of unit production cost to factory selling price:

Unit production cost was defined as the firms' standard cost adjusted for volume variances averaged together for any given product and weighted according to each firm's output (i.e., where more than one firm gave data on the product). Where a firm was importing the product, the cost figure was the import price plus freight and duty. This cost figure was to be expressed as a fraction of factory selling price by year so that the behavior of the ratio over time could be observed. An attempt was made to obtain cost and price data for a consistent model of the product from year to year. Where this was not pos-

sible the closest model in physical features was intended to be used for both price and cost data. This, in fact, proved to be impractical and it was subsequently decided to use average data by product (see page 83). For purposes of testing, the mean ratio was calculated for each sequential time period, and the actual direction of change in the mean ratios compared against the hypothesized upward direction.

c. Rate of capital investment:

Capital investment was defined as the number of dollars invested in product research and development, market research and testing, and production facilities related to the product under study. Total annual investment by each firm involved in the product was to be added together, and then averaged for each stage in the life cycle. The direction of change in this average annual investment was to be compared against the hypothesized upward direction. It was also planned to compare investment in production facilities separately since this might be expected to follow the hypothesized direction more closely. Unfortunately, it proved impossible to generate the data required to test this hypothesis within the time constraints of the thesis.

d. Ratio of component parts imports to domestic production:

A dollar value had to be established for component parts imports since it would be impossible to work with

units. For each product under study each firm was asked what dollar value of related component parts they had imported from the United States each year. Value in this context included freight and duty. This value was then expressed as an amount per unit manufactured in Canada. Amounts for various companies were averaged together for each year and weighted by the sales volume of each firm. Where possible, published data on component parts exports from the U.S. to Canada were also used. The fraction of imported components in Canadian production was then observed through sequential time periods.

e. Technological content in trade:

An attempt was made to establish the extent of product differentiation in trade flows. This was measured in the case of imports by comparing the average price of U.S. exports to Canada by product with the average U.S. factory price. A higher export price would indicate that U.S. exports were weighted toward the top end of the product line and therefore contained some technological improvements (e.g., new features). In the case of exports the relevant comparison was between Canadian export prices and Canadian factory prices.

A further useful measure was a comparison of average landed cost of imports from the U.S. to the average Canadian factory price (or production cost) by product.

If products from the U.S. were selling in Canada in the face of lower priced domestic competition, we then would have a clear indication of product differentiation. The foregoing comparative measures were taken in a series of sequential time periods.

f. Marketing costs and product diversity:

Total marketing cost outlays were compared between firms with narrow product lines and firms with diversified lines. If unit marketing costs were lower for firms with diversified lines, this might be an indication of marketing economies of scale.

g. Canadian ownership:

If the hypothesized pattern of new product introduction into Canada proved accurate, we ought to find that Canadian ownership of production facilities for any given product was low in its early stages, increasing as the product passed through its life cycle.

3. Selection of Products

The foregoing relationships were tested in the context of the major appliance sector of the electrical consumer goods industry in Canada. This industry was chosen because, (a) it involves products at many stages in their life cycles, (b) research and marketing costs are considerable, (c) Canadian firms in the industry compete

side-by-side with U.S. subsidiaries.

Firms were requested, as outlined in the interview guide, to state what they perceived to be the most significant, consumer product innovations in their industry during the past fifteen years. All major appliance products were included in the study, but company responses to this question were used to discover any major innovations within product categories.

It was decided to study two recent product innovations in greater depth, i.e., side-by-side refrigerator freezer and colour television. These products were chosen according to the willingness of firms to disclose pertinent information. It should be noted that data on new products such as these were not available from published sources for the early years of their introduction. It was necessary, therefore, to rely on company data and estimates to complete the information requirements. The various sources of data are specified in appendix A.

4. Gathering of Data

(a) Published Statistics

Data on Canadian imports from the U.S. were obtained largely from U.S. export statistics (FT 410) rather than DBS import statistics. The reasons for this choice were threefold: (1) U.S. export statistics recorded data by product much earlier as a rule than did DBS, (2) for

years when it was possible to compare the two sources, there were often marked variations in the number of units recorded and in their value. These variations were so substantial and persistent from year to year that they could not reasonably be explained as due to differences in the timing of recording, or to the random fluctuations of U.S. sampling procedures, and (3) DBS statistics for earlier years included the value of imported parts in with the value of the units themselves, but not apparently on any systematic basis.

Data that were not available from these or other published sources, such as Merchandising Week and industry associations, were obtained as far as possible by direct interviews with executives of several appliance firms operating in Canada. Since some of the information was considered to be confidential, it was necessary to present it in such a way as to avoid disclosure.

The following firms agreed to participate in supplying information.

Electrohome Limited

RCA Limited

Philips Electronics Industries Limited

Canadian General Electric Co. Ltd. -
Home Entertainment Division

Canadian General Electric Co. Ltd., -
Appliance Division

General Steel Wares Limited

Canadian Westinghouse Co. Ltd.

John Inglis Co. Ltd.

All these firms produced a diversified product range in consumer appliances and faced problems of marketing in any new product introduction. Together they accounted for over 60% of Canadian production in television and stereo ("brown goods") and about 50% of large domestic appliances ("white goods").* They also represented a mixture of Canadian-owned firms (General Steel Wares Limited and Electrohome Limited), a non-U.S. subsidiary (Philips Electronics Industries Limited) and four U.S. subsidiaries. They therefore appeared to constitute a reasonable sample of the purposes of this dissertation.

There are, of course, limitations inherent in gathering data by interviewing company executives. Estimates of executives may be faulty and individual firms may be involved in unique circumstances. But if data on new products were to be gathered there was really no serious alternative. This was particularly true of the two in-depth studies referred to earlier where an attempt was made to understand the main elements of the decision processes of firms contemplating a manufacturing investment to displace imports.

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* These share-of-market percentages are estimates obtained from a senior executive of a large firm in the Canadian industry, and based on brand-share studies conducted for his firm.

It was felt that an understanding of such displacement decisions was imperative to a thorough understanding of aggregate statistics on international trade flows in goods and capital which, after all, merely represent a reflection of the results of many such decisions made at the level of the firm.

The data-gathering task was approached in two stages. Stage one was to obtain industry-wide statistical information on all appliance products, i.e., what the principal new products were; when they were introduced; sales and cost data over time for such products; trade flows in finished goods, component parts and capital. Stage 2 consisted of two in-depth studies into colour television and side-by-side refrigerator freezers, concentrating specifically on the decision situation involved at the point where the Canadian-based firm switched from importing to domestic manufacturing, and the role of the tariff in that decision. The following set of questions was used as a guide for interviews for stage 1.

1. What have been the most significant new consumer product developments in your industry over the past 15 years?

2. When were they first introduced to
   (a) the Canadian consumer and by whom?
   and (b) the U.S. consumer and by whom?

3. When did you first begin marketing these new products?

4. When did you begin assembly operations?

5. By what date were you manufacturing these new products on an integrated basis?

6. For each of the products mentioned, please supply your estimate of total unit and $ sales in Canada for each year beginning with the year of first introduction, and your estimate of your market share of these sales.

7. What amount of capital was required to introduce these new products (include research, marketing and plant investment costs), and how did you raise this capital?

8. Please supply the following additional information for each new product by year from the year of first intro-

duction where possible.

(a) Number of units imported by you and total value of your imports (i.e., import price, plus duty, exchange, sales and excise tax, and freight where applicable).

(b) Your estimate of total imports by the industry as a whole in Canada in units and dollars, and the country of origin. What was the import tariff rate on finished product?

(c) Your standard unit cost of production (adjusted for volume variances) based on a similar model from year to year.

(d) Your price to Canadian dealers from year to year of the model chosen in (c) above.

(e) The variable unit cost of marketing

the product category as a whole.

(f) The total number of units manufactured or assembled by you in Canada.

(g) The number of units exported by you to non-captive export markets, and the unit price received for exports.

(h) The estimated value of component parts imports from (a) United States, (b) other countries by you for the fabrication of the new product in question. What was the import tariff rate on component parts?

The attached table is set out to help in assembling the information requested in questions 6 and 8.

9. Please outline your corporate marketing organization.

10. What is your best estimate of your total corporate fixed expenditure in marketing in 1967? Please include costs of research and development related to consumer appliances.

# BIBLIOGRAPHY

(1) Buzzell, Robert D., "Competitive Behavior and Product Life Cycles", American Marketing Association, 1966 Proceedings, p. 46.

(2) Stobaugh, Robert B. Jr., "The Product Life Cycle, U.S. Exports and International Investment", Unpublished Doctoral Thesis, Harvard Business School, June, 1968.

PART 2

# CHAPTER V

# DISHWASHERS

The dishwasher is perhaps the clearest example of a distinctly new product in the whole spectrum of major appliances. The earliest recorded statistics relate to 1952 when 1,330 units were imported to Canada from the United States. The first production of dishwashers in Canada occurred in 1953 in the plant of a U.S. subsidiary which continued to assemble a small volume from that time on. Other subsidiaries continued to import from their parent organizations until demand in Canada reached higher levels. By 1961, domestic demand had reached 16,600 units, compared to U.S. sales in that year of 620,000 units (see Table 1), and at this point other subsidiaries began to manufacture in Canada. It was in 1961 that the dishwasher was classified as "made in Canada" for duty purposes, and the tariff rate increased from 7 1/2% to 22 1/2%. This process of gradual displacement of imports by Canadian production continued through the 1960's until by 1968 imports from the United States accounted for only 30% of total Canadian sales (see

Chart 1). In absolute numbers imports actually increased during this period, but Canadian sales increased much more rapidly under the impetus of domestic manufacture.

However, this displacement of finished goods imports was compensated by an increase in Canadian imports of component parts, as shown in Table 1. Unfortunately the earliest published statistic which isolated dishwasher parts was in U.S. exports for 1965, which disclosed Canadian imports of U.S. $949,000 or Canadian $1,250,000 after duty. This constituted about $57 worth of component parts for every dishwasher "manufactured" in Canada, and served to underline the continued dependence of Canadian producers on U.S. designs and technology. Component parts imports in total continued to increase each year after 1965, but the value per unit "manufactured" in Canada declined to approximately $47 by 1968 (see Chart 2), which was close to the average value as supplied by participating companies. The dishwasher has in effect been a classic representation of the hypotheses put forth regarding trade flows. The product was developed in the United States and manufactured there in high volume long before any substantial manufacture took place in Canada. The Canadian saturation level in 1968 was approximately where U.S. saturation was in 1957 (see Table 1). U.S. subsidiaries were the catalysts in bringing the product to the Canadian consumer, largely by imports in its early stages. U.S. subsidiaries were also the first to manu-

facture in Canada, although this began as largely an assembly function and has since become more integrated as a manufacturing operation. This process is amply evidenced by the data presented in Table 1. It was also confirmed by discussion with executives of the subsidiaries in question. No Canadian-controlled firms had entered into either marketing or manufacturing of dishwashers by 1968.

The data give rise to a number of additional observations. It will be noted that U.S. exports to Canada accounted for two-thirds of all U.S. dishwasher exports in 1956, and still accounted for 47% in 1968 (see Chart 1). The remaining U.S. exports went largely to Switzerland, West Germany, Sweden and Belgium. It appears from this that Canada and other developed nations play a major role in providing markets for U.S. innovations and further suggests that one of the major factors determining trade flows is the similarity of demand conditions.

A further interesting observation is that the average price of U.S. imports to Canada was substantially higher than the average Canadian cost of production (see Chart 3). Since firms in the U.S. had for several years been manufacturing over 40 times as many dishwashers as firms in Canada, it was clear that substantial scale economies were enjoyed by Americans which Canadians could not achieve. However, as the data in Table 2 show, American exporters did not attempt to underprice in the Canadian market. On

the contrary they exported at prices which were generally well above Canadian production costs and above the average U.S. factory price. This aggregate data reflects a tendency on the part of U.S. producers to export high margin, top-of-the-line models whose relatively low price-elasticity allows the tariff to be passed on to the Canadian consumer. Again this is a tendency which in general terms was confirmed by Canadian industry executives.

It was hypothesized that during the growth stages of a new product, price levels and costs of production would both decline, the former more rapidly than the latter, giving rise to a squeeze in unit gross margins. Although executives in both the Canadian and the Italian appliance industries agreed that the hypothesis reflected their general experience, it proved difficult to obtain convincing data to support it. One of the problems was the continuing change of model mix in the total sales profile. It is necessary to decide whether to use average sales, which mask changes in quality, features and model mix, or to try to trace the price and cost of a consistent model over time. This latter course is normally adopted by government statisticians in their attempts to develop price indices over time. It runs the risk of having to deal with "fictitious" products as it attempts to "eliminate" added features in order to maintain consistency. And in product areas where change is rapid, the models used to determine the price index often become quite unrepresentative of the actual sales mix.

Since many factors such as model mix and quality improvements are expected under the life cycle concept, it was decided to use average price and cost data in an attempt to verify this hypothesis.

In the case of dishwashers, the decline in average prices, especially at the retail level, is clear from the U.S. data shown in Table 2. The Canadian data were quite different, however. It appears that since Canadian production really began (in 1961) both the average price and the average production cost have risen, the former more than the latter resulting in a considerable increase in unit gross margins. What happened in Canada to cause this pattern? And why were margins lower in the earlier years of heavy imports? The answers can be found only by examining company decision processes in the area of pricing and product line policy.

Company executives indicated that, during the early stages of competition in dishwashers, they imported from the U.S. not because of technological inability (this is freely shared in multi-national corporations with wholly-owned subsidiaries), but because of small market size in Canada. They knew that they could manufacture in Canada at unit costs considerably below the landed cost of imports, but a reasonable volume was required in order to justify the required investment in tooling and equipment. Since the problem was one of gaining a good market share in early

years there was a tendency to price as though the product would soon be manufactured in Canada. Hence early gross margins were low but the level of investment was minimal. When further investment was committed in the early 1960's gross margins had to widen to cover the return on the investment, which grew as production scale increased.

One might expect under these conditions that companies would move to increase volume by lowering prices and getting costs down faster. This would certainly coincide with macro-economic theory. Firms, however, tend to be considerably more conscious of the wishes of consumers than do theoreticians, and generally follow a practice of offering a wide range of models covering a whole pricing spectrum. They normally accept lower margins on low-priced models in an attempt to tap the price-elastic market segments, and obtain higher margins on high-priced models which are less responsive to price changes. Once this policy is followed, it is the consumer who determines average factory price behaviour and to a significant extent average production costs, by exercising his choice between models and determining the eventual model mix.

There are three basic types of dishwasher: the top-loading portable, the front-loading portable, and the undercounter or built-in. Most firms in 1968 made a variety of models of each type. The front-loading portables and built-ins were the more expensive models to manufacture

and, as the following table shows, the front-loading type was growing rapidly in market share.

COMPOSITION OF CANADIAN SALES OF DISHWASHERS (% of units)

| | 1966 | 1967 | 1968 |
|---|---|---|---|
| Top-loading portables | 53.5 | 51.0 | 46.6 |
| Front-loading portables | 6.6 | 10.5 | 15.8 |
| Undercounters | 39.9 | 38.5 | 37.6 |
| | 100.0% | 100.0% | 100.0% |

In addition to the above-detailed swing towards higher-priced types of dishwashers, there was also a substantial swing towards higher-priced models in the still dominant top-loading portable category, as follows:

CHANGES IN THE PRICE COMPOSITION OF SALES OF TOP-LOADING PORTABLES IN CANADA

| | 1963 | 1968 |
|---|---|---|
| Over $200 | 18% | 42% |
| $170 - $200 | 21 | 44 |
| Under $170 | 61 | 14 |
| | 100% | 100% |

This trend to higher prices may, of course, have been due to general price inflation rather than a move by consumers towards better models. Industry sources, however, indicated their belief that most of it was a result of

added features and product improvements.

One further influence on prices and costs was the trend towards greater variety in colors which did not really begin until 1965.

It is clear from these figures that the rising price and cost levels between 1963 and 1968 in Canada were at least partly a result of consumer preference for higher-priced models and color variety. The reason why such trends developed relatively early in the Canadian market life cycle was probably related to the ready Canadian access to U.S. advertising of product styles and features in their more mature market.

One other factor that has an influence on average factory price figures is the distribution of sales by channel of distribution. A manufacturer may sell to builders, department stores or appliance dealers. The manufacturer's marketing cost is naturally highest when he sells direct to dealers and his factory price reflects this. Factory prices for the same model are lower for sales to builders and department stores. Any substantial swing in the distribution pattern can therefore cause a change in the average factory price. It is generally expected that as a product matures, department and chain stores will take an increasing share of the market causing a decline in average factory price. This pattern was explained by executives as being due to

BREAKDOWN OF DISHWASHER SALES BY COLOR

| | Top-loading | | Front-loading | | Undercounters | |
|---|---|---|---|---|---|---|
| | 1967 | 1968 | 1967 | 1968 | 1967 | 1968 |
| Copper | 10% | 14% | 10% | 15% | 24% | 24% |
| Avocado | 3 | 10 | 3 | 13 | 15 | 30 |
| Other colors | 1 | 1 | 3 | 1 | 11 | 8 |
| White | 86 | 75 | 84 | 71 | 50 | 38 |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |

the more aggressive selling approach of dealers with products that are new to the consumer. Thus although the department store share of dishwasher sales was growing, as the following data show, it was at a much lower level than with more mature appliance products. The price effects of this swing in distribution were, however, overpowered by the factors mentioned previously that were pushing average prices upwards.

CANADIAN SALES OF DISHWASHERS
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 59.0% | 54.9% | 51.7% |
| Dept. and Chain Stores | 25.8 | 28.9 | 32.1 |
| Builders | 15.2 | 16.2 | 16.2 |
| | 100% | 100% | 100% |

Since the dishwasher in 1968 was only just entering its growth stage in Canada (forecasts called for annual sales of 150,000 units by 1973), it was perhaps too early to expect the decline in prices that had already occurred in the United States.

# TABLE 1
## DISHWASHERS
### U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports From U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Saturation % (1) Can. | Saturation % (1) U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | | 230 | | | | | | | | |
| 1 | | 260 | | | | | | | | |
| 2 | 1.3 | 175 | 1.3 | 100 | 3.1 | 42 | | | | |
| 3 | 2.2 | 180 | 1.9 | 86 | 3.4 | 56 | | | | |
| 4 | 3.1 | 215 | 2.7 | 87 | 3.9 | 69 | | | | |
| 5 | 3.9 | 295 | 3.3 | 85 | 5.5 | 60 | | | | |
| 6 | 6.2 | 400 | 5.9 | 95 | 8.9 | 66 | | | | |
| 7 | 6.3 | 390 | 5.8 | 92 | 9.4 | 62 | | 5.2 | | |
| 8 | 9.8 | 425 | 9.2 | 94 | 12.3 | 75 | 0.7 | 5.8 | | |
| 9 | 12.4 | 547 | 11.5 | 93 | 15.8 | 73 | 1.0 | 6.3 | | |
| 1960 | 14.7 | 555 | 13.7 | 93 | 24.2 | 57 | 1.3 | 7.1 | 60E | 60 |
| 1 | 16.6 | 620 | 10.7 | 65 | 27.6 | 39 | 1.5 | 7.9 | 360E | 60 |
| 2 | 18.0 | 720 | 10.3 | 57 | 29.4 | 38 | 1.7 | 8.9 | 460E | 60 |
| 3 | 23.1 | 880 | 11.7 | 51 | 39.8 | 30 | 2.1 | 9.0 | 680E | 60 |
| 4 | 31.4 | 1,050 | 12.1 | 39 | 41.5 | 29 | 2.2 | 11.8 | 1,160E | 60 |
| 5 | 38.2 | 1,260 | 16.4 | 43 | 52.4 | 31 | 2.7 | 13.5 | 1,250 | 57 |
| 6 | 50.0 | 1,528 | 19.6 | 39 | 65.4 | 30 | 3.2 | 15.7 | 1,400 | 46 |
| 7 | 59.6 | 1,585 | 21.8 | 37 | 53.1 | 41 | 4.4 | 18.1 | 1,710 | 45 |
| 8 | 72.2 | 1,961 | 21.6 | 30 | 45.9 | 47 | 5.1 | 20.8 | 2,425 | 47 |
| 9 (6 mos.) | | 971 | 8.9 | | 17.4 | 51 | | | | |
| Source | (1) | (2) | (3) | | (10) | | (4) | (2) | (5)&(3) | |

(1) Saturation refers to the percentage of wired homes possessing one or more of the appliance in question.

# TABLE 2

## DISHWASHERS

## U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | | | | | | | | | 290 |
| 1 | | | | | | | | | 300 |
| 2 | | | | | | | *7.5* | 208 | 300 |
| 3 | | | | | 185 | *.983* | *7.5* | 184 | 300 |
| 4 | 200 | 150E | | 27 | 173 | *.973* | *7.5* | 184 | 300 |
| 5 | 200 | 153E | | 34 | 166 | *.986* | *7.5* | 165 | 306 |
| 6 | 190 | 145E | | 40 | 150 | *.984* | *7.5* | 156 | 290 |
| 7 | 185 | 134E | | 36 | 149 | *.959* | *7.5* | 156 | 267 |
| 8 | 185 | 137E | | 46 | 139 | *.971* | *7.5* | 147 | 275 |
| 9 | 200 | 135E | | 58 | 142 | *.959* | *7.5* | 146 | 255 |
| 1960 | 190 | 135E | | 52 | 138 | *.970* | *7.5* | 145 | 255 |
| 1 | 200 | 135E | 114 | 35 | 192 | *1.013* | *22.5* | 158 | 250 |
| 2 | 210 | 133E | 117 | 45 | 202 | *1.069* | *22.5* | 155 | 242 |
| 3 | 230 | 133E | 118 | 69 | 202 | *1.078* | *22.5* | 157 | 240 |
| 4 | 230 | 135 | 116 | 82 | 198 | *1.079* | *22.5* | 157 | 221 |
| 5 | 226 | 134 | 120 | 73 | 198 | *1.078* | *22.5* | 149 | 219 |
| 6 | 230 | 133 | 118 | 88 | 180 | *1.077* | *22.5* | 143 | 216 |
| 7 | 222 | 139 | 126 | 82 | 166 | *1.079* | *22.5* | 137 | 213 |
| 8 | 234 | 135 | 119 | 104 | 155 | *1.078* | *15.0* | 136 | 220 |
| 9 | | | | | 159 | *1.077* | *15.0* | | |
| Source | (6) | (7) | (20) | (21) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data were obtained by averaging the unit production costs of two major manufacturers who accounted for 60% of all dishwashers made in Canada in 1968. Production costs of one other major high cost producer were not obtainable. It is, therefore, expected that the average production cost shown above may be low and the gross margin somewhat higher than actual.

CHART 1
DISHWASHERS

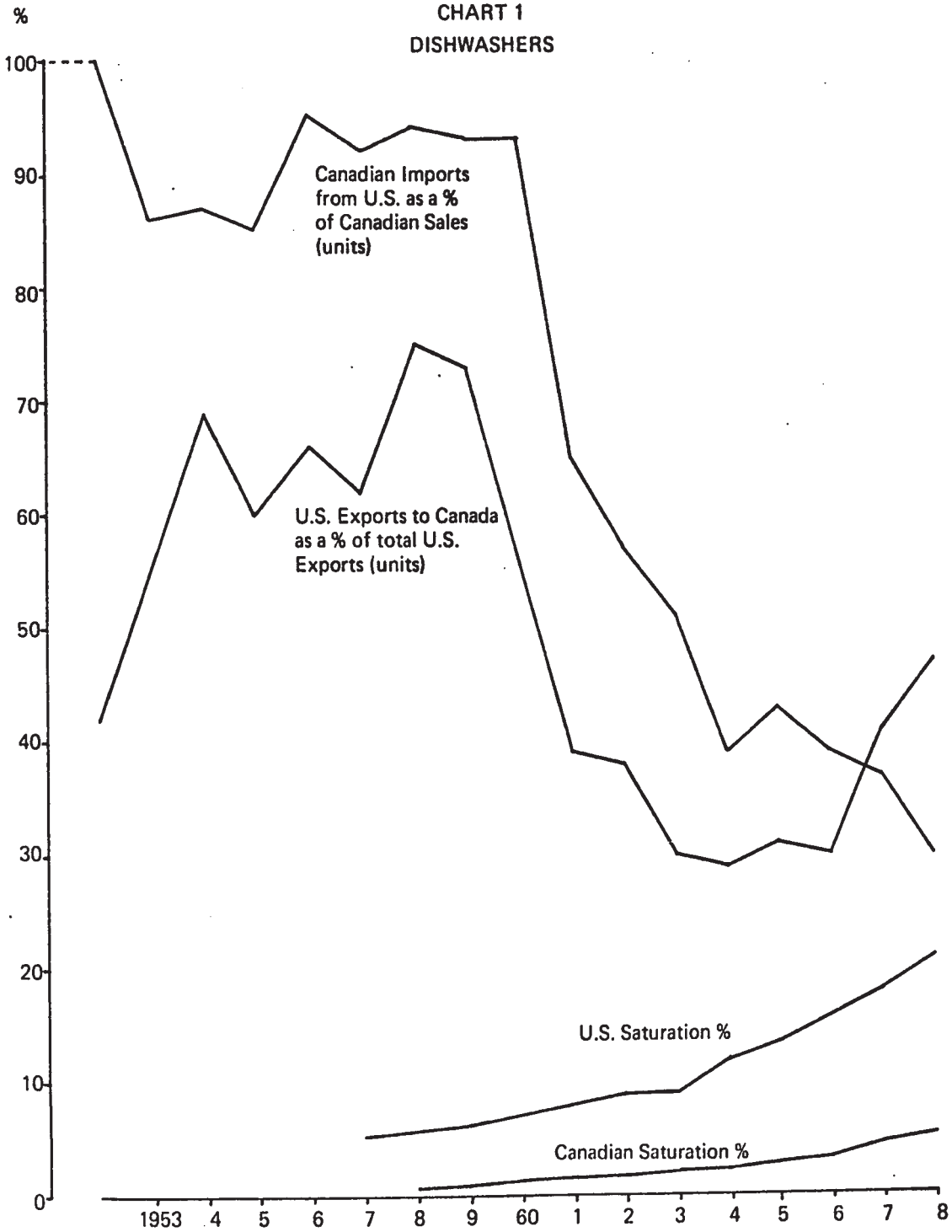


CHART 2
DISHWASHERS

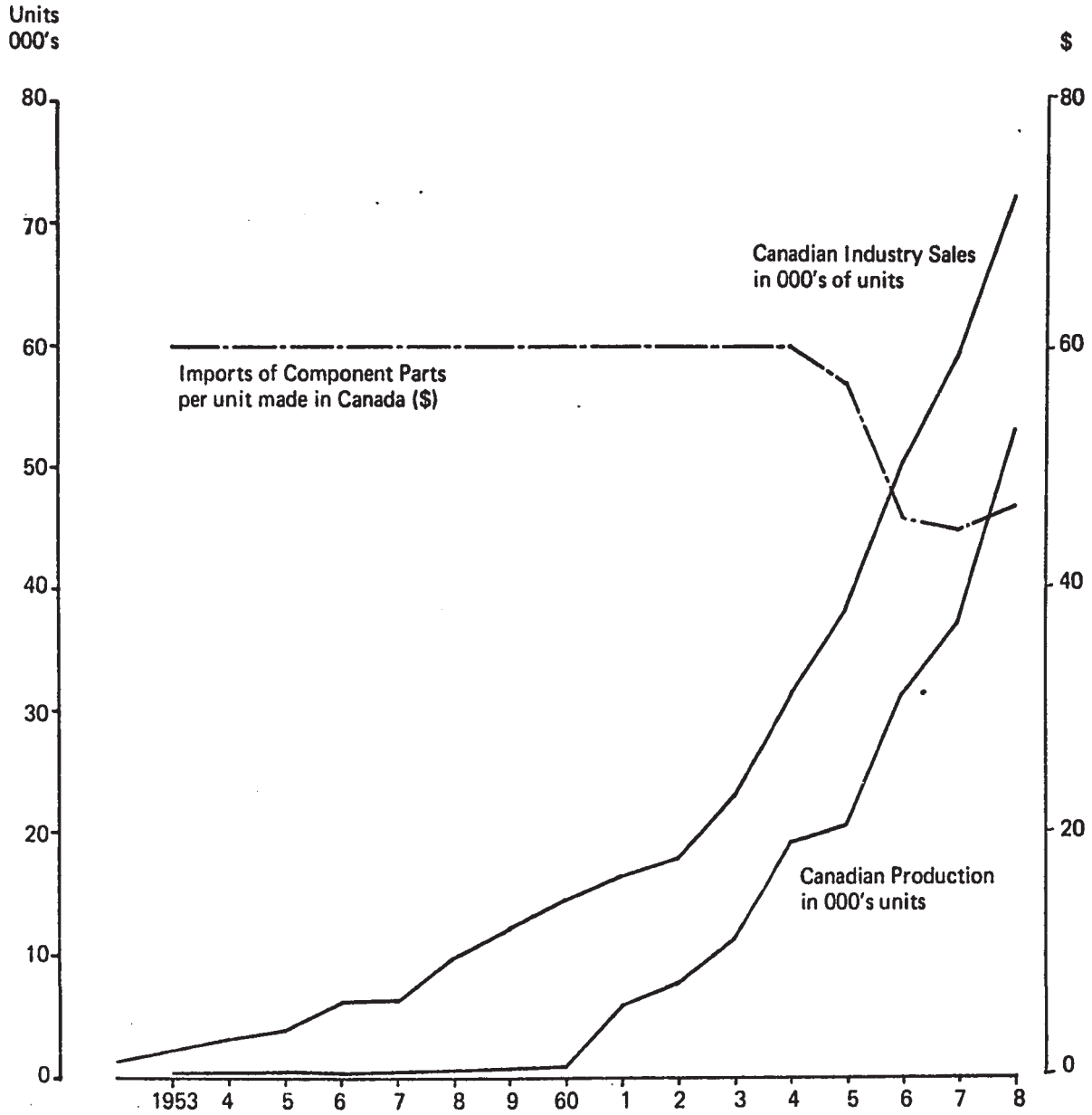
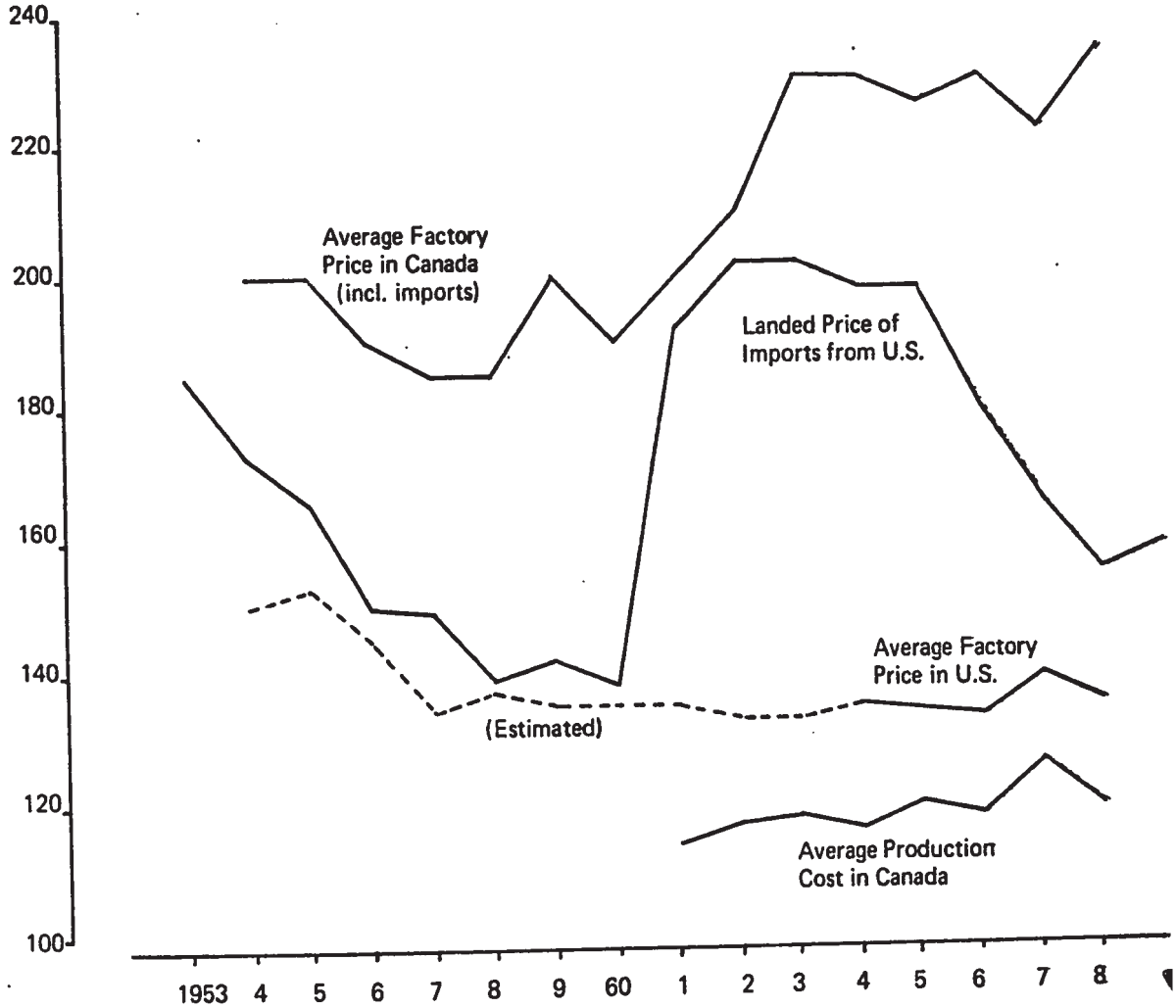


CHART 3
DISHWASHERS



## SOURCES OF STATISTICAL DATA

1. Company production estimates plus units imported.
2. Merchandising week.
3. U.S.Exports FT 410, Bureau of the Census (U.S. dollar figures are multiplied by the exchange and duty rates in arriving at landed cost of imports).
4. DBS 64-202
5. Estimated from company data.
6. Estimated by companies - includes sales of imports.
7. U.S. industry data, supplied by a U.S. appliance maker. Figures marked E are estimated by the writer from U.S. retail prices. Retail margins were close to 50% in 1958 and earlier years.
8. Canadian Imperial Bank of Commerce, London, Ontario.
9. Supplied by participating companies.
10. Merchandising Week - from U.S. Customs data.
11. DBS 43-201 (1950-56): DBS 43-204(1957-68) (Does not include sales of imports).
12. DBS 43-201, DBS 43-204 plus units imported.
13. Company estimates of industry sales.
14. Computed from information supplied by companies.
15. DBS 65-007 (units and value).
16. DBS 43-201/5 plus imports, less adjustment for colour T.V. from 1963 on.

17. DBS 43-201/5 (not including sales of imports), less adjustment for value and volume of colour T.V. from 1963 on.
18. DBS 41-209 and 43-204 plus units imported.
19. DBS 41-209 and 43-204 - does not include sales of imports.
20. Derived from average production cost data by product category supplied by participating firms.
21. The difference between average factory price and a weighted average of production cost and import price. The weighting was based on the % of imports to domestic sales.
22. The difference between average factory price and average cost of production. Imports are not included in either figure.
23. Department of Industry, Trade and Commerce, Ottawa.
24. U.S. Electronics Industry Association (EIA).

## CHAPTER VI

## ROOM AIR CONDITIONERS

The room air conditioner is also a relatively new product introduced into Canada in the early 1950's via imports from the U.S., and first manufactured in Canada in 1961 when national sales volume had reached 23,000 units. By 1966, as Table 3 shows, imports accounted for only 27% of total Canadian sales, but had risen back to 37% in 1968. Again we see patterns emerging that are similar to the dishwasher situation, with imports being displaced by domestic production as domestic demand rises (see Chart 4). Saturation level in Canada was 3.2% in 1968 as compared with 42.5% in the U.S. (Table 3), where production output was almost 100 times the volume of Canadian production.

Once Canadian production had begun it was heavily dependent on the United States for component parts and remains so to the present time, as Chart 5 depicts. This is difficult to show from published statistics, since air conditioner parts are merged with refrigerator parts in U.S. export statistics and with air conditioning equipment

in Canadian import statistics. In both cases the dollar values shown are far in excess of the amounts that could possibly have been brought in as components for room air conditioners. However, direct information from two Canadian manufacturers indicated an average level of component imports of $79 per unit in 1968. Both of these companies were U.S. subsidiaries and were in the forefront in manufacturing air conditioners in Canada. However, it was discovered that their propensity to import components was not paralleled by Canadian owned firms.

The question is sometimes raised whether independent Canadian firms might be less prone to import components than U.S. subsidiaries. Because of the process of new product introduction in international companies, subsidiaries reap the benefit of parent company designs, engineering and tooling. Hence, when a subsidiary moves to assemble in Canada, it automatically purchases component parts requirements from its parent or its parent's suppliers, which it often gets at very preferential prices due to parent company buying power. Since independent Canadian firms can seldom obtain these preferential import prices, they may be expected to move more quickly into integrated manufacture or towards Canadian component suppliers.

From discussions with executives of independent Canadian firms, this seems in fact to be the case with air conditioners. Canadian firms generally did not do their own

original research and product development, but opted for licensing arrangements with well-known, established manufacturers, usually in the U.S. Thus, initially, Canadian firms also tended to import components from their licensor in the early stages and then gradually moved to source more and more of the parts in Canada. How quickly this takes place is governed by two major factors: first, does the company have sufficient market share to warrant spending the time on repeated "make-or-buy" type decisions? And, second, what is the cost differential between the import price plus duty, and the cost of manufacturing or sourcing in Canada? In such an analysis the cost of manufacturing has to include a return on the investment required. One Canadian firm had in fact gone from the point of importing all air conditioner components from its U.S. licensor - about $70 per unit on average - to 80% Canadian-sourced by 1968, while U.S. subsidiaries continued to import all of their component requirements. Again this probably reflected more attractive import prices to subsidiaries. However, this particular company recently changed licensors and planned to revert to heavy component imports again and presumably resume its practice of gradual displacement by Canadian sourced components.

Two important points emerge from this discussion. The Canadian tariff on component parts imports clearly speeds up the process of Canadian manufacture of components. Its reduction or removal, while reducing the materials cost of

the finished products, would result in a generally less integrated Canadian industry. On the other hand it would not stimulate Canadian exports of the finished product back to the U.S. because of the following key factor. Both independent Canadian firms and U.S. subsidiaries in Canada rely on U.S. sources for research and product design. Even when integrated manufacture is taking place in Canada, we still make essentially the same product with the same basic components, and are thus unable to develop any unique product advantage as a basis for exporting.

In terms of trying to estimate total component parts imports over time for air conditioners, it is clear from the above that the average value per unit will have declined from year to year. The figures on Table 3 were developed by taking the market share in units held by subsidiaries and multiplying by the average component imports per unit as disclosed by them. To this figure is added an estimate for Canadian-owned companies which drops at 15% per year from 1963 on, beginning at $70 per unit in 1961.

Canadian industry sales volume and average factory prices as shown on Tables 3 and 4 were also developed from company estimates since published statistics are unusually scarce for this product. Canadian imports were calculated from U.S. export publications, and there is some doubt in the minds of many Canadian company executives as to their accuracy for years prior to 1963. The U.S. statistics shown

in Tables 3 and 4 were much easier to obtain, and are more likely to be accurate.

U.S. exports to Canada ranged between 10-20% of total U.S. exports of air conditioners (see Table 3). Clearly, income level was not the key determinant of demand in this case. Climate conditions would have to be an equally important determinant and will probably place limits on maximum Canadian saturation levels. The average price of Canadian imports was again considerably above the average Canadian cost of production and often higher than the average Canadian factory price, reflecting a preponderance of large BTU units in imports (see Chart 6). Again the average price of all U.S. exports of air conditioners was higher than the average factory price within the U.S.

As expected there was a steady and substantial drop in price, particularly at the retail level, as the product achieved greater saturation in the U.S. market, but average Canadian factory prices did not reflect this decline. Again the reason was linked to the fact that Canada had readily available all the choice and product features developed for the more mature U.S. market. With air conditioners the critical variable is size (or BTU rating) and most manufacturers had several models in each major size bracket. As can be seen from the following data, there has been an average move upwards in BTU size on the part of Canadian consumers.

CANADIAN SALES OF ROOM AIR CONDITIONERS BY BTU SIZE

| | 1963 | 1968 |
|---|---|---|
| 7,000 BTU and under | 53% | 40% |
| 7,000 - 9,000 BTU | 19 | 32 |
| 9,000 - 11,000 BTU | 6 | 12 |
| 11,000 - 15,000 BTU | 9 | 7 |
| Over 15,000 BTU | 13 | 9 |
| | 100% | 100% |

Source: Industry estimates.

It was interesting to note that of the 24,000 units imported from the U.S. in 1968, 9,674 were over the 10,000 BTU size. The total Canadian market was 65,000 units in 1968, and if we assume from the above data that 22% of them were over 10,000 BTU, we have 14,300 units, of which U.S. exporters accounted for 68%. The average export price in U.S. dollars of the over-10,000 BTU units was $181 in 1968 compared to $126 for the units below 10,000 BTU. Even the latter figure, however, is higher than the average Canadian production cost before duty and exchange are added. Again it seems clear that U.S. exporters are not following a strategy of underpricing the market in Canada despite their exclusive access to scale economies. On the contrary, it is a common practice for subsidiaries to import top-of-the-line models from their parent when demand in Canada is too low to make it feasible to manufacture them here.

The distribution of air conditioner sales by channel showed the same tendency in Canada as that shown by dishwashers. As the following information shows, the independent dealer was in process of losing his market share to department stores and builders. This tendency in Canada for department stores to lag in market share of new products is a rather unusual and revealing fact. Department stores ought, by virtue of their extensive credit facilities, promotion and return privileges, to be at the forefront in overcoming consumer doubt about new products, but, in the words of one industry executive, "they seem to adopt a uniform 'price-off' approach in marketing most appliances which may not be particularly effective with new products."

SALES OF ROOM AIR CONDITIONERS
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 60.5% | 54.7% | 50.3% |
| Dept. and chain stores | 27.6 | 30.7 | 36.8 |
| Builders | 11.9 | 14.6 | 12.9 |
| | 100% | 100% | 100% |

One might expect that this downward trend in dealer sales would have caused downward pressure on average factory prices. The fact that this did not occur in Canada was due in part to the previously described increase in BTU size of units sold, and also to the very early stage of the product's

growth pattern. Industry estimates called for a substantial increase in air conditioner sales during the following five years, to reach 120,000 units annually by 1973 (88% growth over five years). During this time we may expect to see some decline in price levels, as Canadian producers achieve larger output volumes. However, the present level of gross margins is not particularly attractive when compared to dishwashers, and this may well be due to the existence of a strong Canadian competitor not so dependent on imports of components.

# TABLE 3
## ROOM AIR CONDITIONERS
### U.S.–Canadian Industry Statistics

| | Industry Unit Sales | | Can. Imports From U.S. Units 000's | % Imports to Can.Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Saturation % | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | | | | | Can. | U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | .0 | 201 | .0 | 100 | 7 | 1 | | | | |
| 1 | .9 | 238 | .9 | 100 | 13 | 7 | | | | |
| 2 | .9 | 380 | .9 | 100 | 20 | 4 | | | | |
| 3 | 8.0 | 1,045 | 8.0 | 100 | 41 | 20 | | | | |
| 4 | 10.9 | 1,353 | 10.9 | 100 | 59 | 18 | | | | |
| 5 | 7.7 | 1,276 | 7.7 | 100 | 65 | 12 | | | | |
| 6 | 25.4 | 1,828 | 25.4 | 100 | 95 | 27 | | | | |
| 7 | 19.3 | 1,586 | 19.3 | 100 | 112 | 17 | | 9.6 | | |
| 8 | 11.6 | 1,673 | 11.6 | 100 | 138 | 8 | | 11.7 | | |
| 9 | 8.0 | 1,660 | 8.0 | 100 | 109 | 7 | | 12.8 | | |
| 1960 | 22.9 | 1,580 | 22.9 | 100 | 130 | 18 | | 15.1 | | |
| 1 | 23.0 | 1,500 | 12.0 | 52 | 126 | 10 | | 17.0 | 770 | 70 |
| 2 | 27.0 | 1,580 | 16.5 | 61 | 135 | 12 | 1.7 | 18.8 | 735 | 70 |
| 3 | 31.0 | 1,945 | 11.2 | 36 | 162 | 7 | 1.9 | 19.4 | 1,254 | 63 |
| 4 | 45.0 | 2,755 | 17.2 | 38 | 215 | 8 | 2.1 | 20.2 | 1,613 | 58 |
| 5 | 45.0 | 2,945 | 15.8 | 35 | 228 | 7 | 2.2 | 24.2 | 1,568 | 54 |
| 6 | 49.0 | 3,345 | 13.2 | 27 | 277 | 5 | 2.6 | 29.9 | 1,465 | 41 |
| 7 | 62.0 | 4,129 | 20.4 | 33 | 329 | 6 | 3.2 | 36.7 | 1,641 | 39 |
| 8 | 65.0 | 4,026 | 24.0 | 37 | 365 | 7 | 3.2 | 42.5 | 1,770 | 43 |
| 9 (6 mos.) | | 3,863 | 16.2 | | 304 | 5 | | | | |
| Source | (13) | (2) | (3) | | (10) | | (4) | (2) | (14) | |

# TABLE 4
## ROOM AIR CONDITIONERS
### U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | | 156E | | | 272 | *1.070* | *10.0* | 283 | 312 |
| 1 | | 168E | | | 218 | *1.052* | *7.5* | 276 | 337 |
| 2 | | 170E | | | 240 | *.979* | *7.5* | 285 | 341 |
| 3 | | 167E | | | 178 | *.983* | *7.5* | 239 | 335 |
| 4 | | 162E | | | 184 | *.973* | *7.5* | 226 | 325 |
| 5 | | 150E | | | 210 | *.986* | *7.5* | 219 | 300 |
| 6 | | 147E | | | 167 | *.984* | *7.5* | 196 | 293 |
| 7 | | 155E | | | 170 | *.959* | *7.5* | 239 | 310 |
| 8 | | 140E | | | 172 | *.971* | *7.5* | 186 | 279 |
| 9 | | 145E | | | 210 | *.959* | *7.5* | 193 | 269 |
| 1960 | | 154E | | | 180 | *.970* | *7.5* | 185 | 275 |
| 1 | 200 | 150E | | | 198 | *1.013* | *7.5* | 193 | 259 |
| 2 | 206 | 151E | | | 209 | *1.069* | *7.5* | 190 | 260 |
| 3 | 214 | 151E | 136 | 47 | 195 | *1.078* | *7.5* | 189 | 252 |
| 4 | 202 | 141 | 128 | 49 | 171 | *1.079* | *7.5* | 179 | 215 |
| 5 | 206 | 137 | 124 | 49 | 192 | *1.078* | *7.5* | 184 | 212 |
| 6 | 192 | 134 | 124 | 41 | 224 | *1.077* | *22.5* | 179 | 209 |
| 7 | 209 | 140 | 139 | 46 | 214 | *1.079* | *22.5* | 179 | 210 |
| 8 | 212 | 140 | 122 | 67 | 183 | *1.078* | *15.0* | 176 | 210 |
| 9 (6 mos.) | | 139 | | | 192 | *1.077* | *15.0* | | |
| Source | (6) | (7) | (20) | (21) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data were obtained by averaging the unit production costs of two major manufacturers who accounted for 46% of all room air conditioners made in Canada in 1968. Both were subsidiary companies importing virtually all their component parts requirements. It is likely that Canadian-owned competitors are manufacturing at slightly lower average costs.

CHART 4

ROOM AIR CONDITIONERS

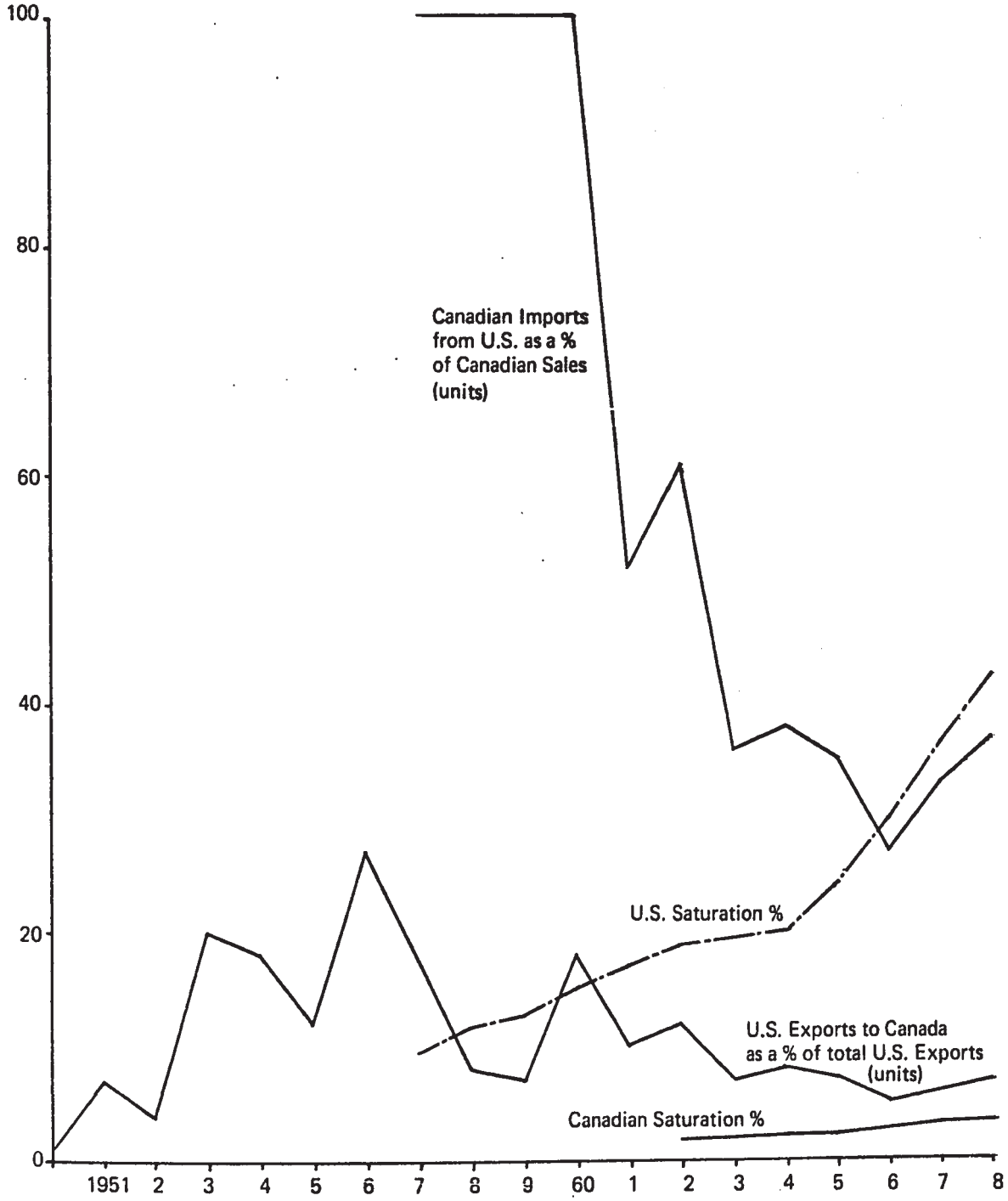


CHART 5

ROOM AIR CONDITIONERS

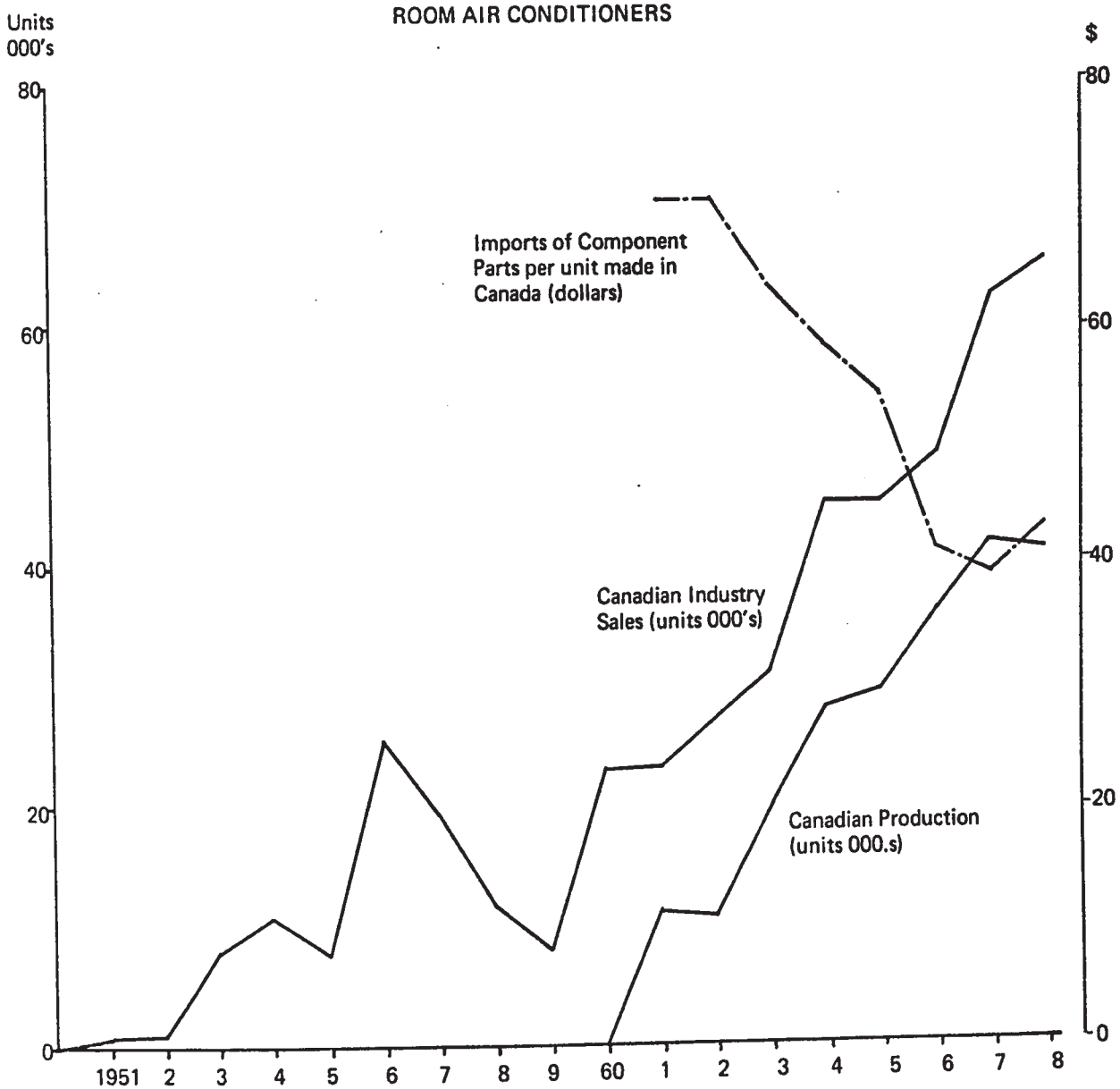
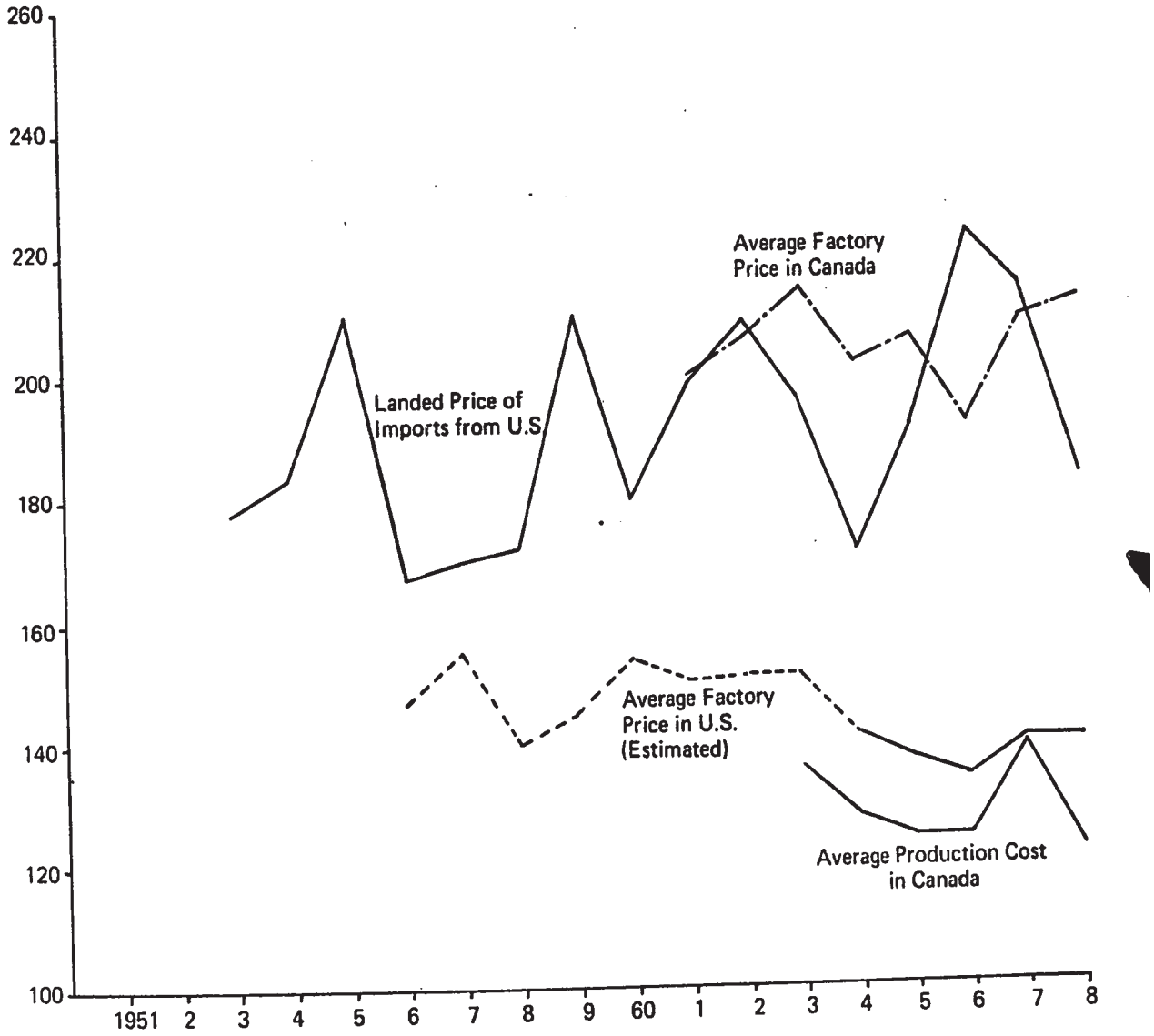


CHART 6

ROOM AIR CONDITIONERS



# CHAPTER VII

## FOOD FREEZERS

The freezer, by 1968, had passed through its introductory and growth stages, and had achieved significant saturation. First recorded manufacture of freezers in Canada was in 1948 when 1,400 were produced at an average factory price of $300. The earliest recorded imports were for 1952 when 15,700 units, more than three times Canadian production, came in from U.S. exporters. Undoubtedly there were imports prior to 1952 but the data were not available. From 1952 through 1956, imports from the U.S. continued to dominate the Canadian market, amounting to over 70% of Canadian sales every year. The year 1957 saw the beginning of the process of displacement of imports, which by 1962 were down to 7% and, by 1963, 2% of Canadian sales (see Chart 7). After this time imports from the U.S. remained at nominal levels. The hypothesized process of import displacement was complete and there appeared to be a possibility that Canadian firms might have been in a position to export to the U.S. from about 1964 on.

An examination of Canadian exports disclosed a surge in freezer exports to the U.S. from 1963 to 1966 which, it turned out, was due to a temporary arrangement between a subsidiary and its parent. Prior and subsequent to these dates Canadian exports were at negligible levels. Precise data on freezer exports appears in the section on refrigerators, since the two products are grouped together in Canadian export statistics. As discussed later there were valid reasons why Canadian firms were generally unable to export freezers into the U.S. market.

Unfortunately it was impossible to obtain figures on trade flows in freezer components. U.S. export statistics combine them with miscellaneous refrigerator parts and Canadian import statistics do not identify them at all. Companies currently involved in the manufacture of freezers in Canada, however, indicated that direct component parts imports were about 20% of production costs in 1968, and used to be higher. Many of them were then sourced in Europe rather than the U.S. Furthermore many Canadian component suppliers were themselves heavy importers of subcomponents.

It was impossible to find out the import level of components in earlier years. Most freezers made in Canada in 1968 were made by Canadian owned firms whose records did not disclose this kind of historic detail.

The industry forecast for freezers was for virtua

no growth over the five years to 1973; annual sales were expected to remain around 170,000 to 180,000 units. Saturation level had reached 29.2% by 1968 compared to only 28.5% in the U.S. (see Table 5), and Canadian production had been well over 10% of U.S. production every year since 1962. The freezer had clearly entered its maturity stage, and in the longer term could probably be expected to decline as two-door refrigerators offered larger freezer space. The side-by-side, discussed later, was thought to have caused the stagnation of freezer sales in the U.S., and was expected to cause a decline in Canada in due course.

In these conditions, i.e., absence of innovation and levelling off of industry sales, we would expect to find a steady decline in Canadian factory prices which Table 5 shows to be very much the case. Average factory prices declined from $301 in 1950 to $138 in 1967 and did so in the face of gradually increasing freezer sizes, as follows:

TRENDS IN THE SIZE COMPOSITION
OF CANADIAN FREEZER SALES

| All Freezers | 1961 | 1963 | 1965 | 1967 |
|---|---|---|---|---|
| Under 11 cu. ft. | 2% | 1% | 4% | 6% |
| 11.0 - 13.9 | 6 | 8 | 4 | 4 |
| 14.0 - 15.9 | 24 | 15 | 21 | 15 |
| 16.0 - 17.9 | 31 | 28 | 6 | 11 |
| 18.0 - 19.9 | 4 | 4 | 13 | 17 |
| 20.0 - 22.9 | 32 | 39 | 41 | 27 |
| Over 23.0 | 1 | 5 | 11 | 20 |
| Total | 100% | 100% | 100% | 100% |

Source: C.A.M.A.

The trend to higher sizes in Canada is perhaps easier to discern if the above data is assembled on a high-low size basis dividing at 17.9 c.f. and compared to corresponding U.S. figures.

COMPOSITION OF FREEZER SALES BY SIZE
- CANADA VERSUS U.S.

| | 1961 | | 1963 | | 1965 | | 1967 | |
|---|---|---|---|---|---|---|---|---|
| | U.S. | Can. | U.S. | Can. | U.S. | Can. | U.S. | Can. |
| Low | 71 | 63 | 76 | 52 | 72 | 35 | 74 | 36 |
| High | 29 | 37 | 24 | 48 | 28 | 65 | 26 | 64 |

In the light of this trend the substantial decline in Canadian factory price was truly remarkable. By 1965 the average Canadian factory price was below its U.S. counterpart, despite the fact that Canadian producers were manufacturing larger models on average.

The degree of downward pressure on factory prices was so extensive that gross margins suffered substantially. The D.B.S. industry selling price index for freezers (62-002) showed a decline to 69.0 in 1967 from a base of 100 in 1956. A similar index drawn from factory price data in Table 6 shows a decline in 55.2 in 1967. This comparison would certainly indicate the total absence of any mix effect in the factory price data (i.e., absence of new features or other "hidden" consumer benefits), and tends to confirm the move to more extensive private branding.

It was difficult to obtain proper cost data from the firms involved in freezer production. The large integrated appliance producers had mostly stopped making freezers although many still marketed them as stencil brands. Much of the manufacturing (about 67%) was in the hands of Canadian-owned producers, many of whom were heavily committed to stencil production for department stores and other manufacturers. These firms were generally reluctant to supply cost information, but it was mentioned by several of them that the freezer business was in a state of break-even operation. For the most part, these firms had negligible marketing costs, since the marketing function was largely performed by their customers. This is a situation in which manufacturers tend to lose control of their pricing policy (to their customers) and where profit margins are forced to lower and lower levels. Apparently a good deal of freezer production was taking place in old, "fully-depreciated" facilities, and there was insufficient profit to allow for expansion, modernization or research.

These observations suggest that the competitiveness of Canadian freezer manufacturers vis-a-vis the U.S. may have been more illusory than real. Since Canadian manufacturers did not have to market most of their output, their factory prices reflected the decrease in marketing and administrative costs that comes with private and stencil brand operations. It was believed that U.S.

factory prices reflected more of a marketing element. It would also appear that the poor margins available to freezer manufacturers in Canada may make it difficult for them to perpetuate their activities.

Looking briefly at Table 5, it is significant how large a percentage of U.S. freezer exports went to Canada during the mid-fifties (e.g., 1956 - 82%; 1959 - 70%). Again it appears that while this product was relatively new and U.S. companies held an innovative lead, most of their exports came to the receptive Canadian market.

The U.S. export price to Canada was always higher than the U.S. factory price, reflecting the profitability of export business in the innovative stage. Furthermore, the laid down cost of Canadian imports from the U.S. was consistently higher than the average factory price in Canada after 1959 - the year that Canadian production first exceeded import levels.

One very striking thing about the food freezer in Canada was the almost total lack of significant style or feature improvements over time. The freezer was perceived generally as a basement item; it was not built for show, color was irrelevant, and shape had remained oblong. This was not the case in the United States, where far fewer homes had basements. Freezers in the U.S. were designed more for the kitchen and were styled accordingly.

For example, in 1968, 55-60% of U.S. freezers were uprights whereas, in Canada, 92% were chest-type. U.S. freezer producers, many of whom also manufactured refrigerators, had gone heavily into foamed insulation which allows greater internal capacity from the same external dimensions, and thus economizes on kitchen space. Canadian producers, most of whom were not involved in refrigerator technology, had not faced the same incentives to reduce external dimensions and were not therefore committed to foamed insulation.

Thus when we observe from Tables 5 and 6 that Canadian producers could match U.S. producers at the factory price level, we must also keep in mind that the chest type is cheaper to manufacture than the upright, and that U.S. producers had to pay much more attention to style, features and trim. In effect, the freezer in Canada had become something of a commodity item, and future exports were expected to be influenced largely by price. When trade flows from the U.S. to Canada were heavy, price was clearly not the causal determinant of trade. At that time the laid-down cost of Canadian imports from the U.S. was much higher than what the average Canadian production cost turned out to be. This situation may be usefully compared to 1966-68, when freezers began to be imported from Japan and Italy, as follows:

| | Avg. Price of Imports from Japan | Avg. Price of Imports from Italy | Avg. Production Cost in Canada |
|---|---|---|---|
| 1966 | $51 | $50 | $128 |
| 1967 | 48 | 57 | 127 |
| 1968 | 60 | 57 | 126 |

Source: Calculated from D.B.S. 65-007.

The import prices quoted above do not include applicable duty to render a more precise comparison, but the figures are so much below average Canadian production costs that the implications are clear. These imports, of course, were of small capacity freezers for which a small market did appear to exist in Canada as long as prices were low. This type of low price, small capacity trade is in many ways similar to the "low-wage" trade referred to in earlier chapters. It is an area where U.S. producers seldom appear, and where Canadian producers cannot begin to match import competition - partly because the Canadian market for these compact sizes is so small in relation to the European market, and partly because of the lower wage costs in these exporting countries. This is an altogether different kind of import competition than that which Canadians usually face from the U.S.

TABLE 5

FREEZERS

U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | |
|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. |
| 1950 | | 890 | n.a. | | n.a. | | | |
| 1 | | 1,050 | n.a. | | n.a | | | |
| 2 | 21 | 1,140 | 15.7 | 75 | 21.8 | 72 | | |
| 3 | 40 | 1,090 | 32.3 | 81 | 40.2 | 80 | | |
| 4 | 31 | 990 | 23.2 | 75 | 32.0 | 73 | | |
| 5 | 58 | 1,100 | 44.7 | 77 | 56.8 | 79 | | |
| 6 | 58 | 975 | 45.7 | 79 | 55.8 | 82 | | |
| 7 | 61 | 925 | 40.1 | 66 | 53.6 | 75 | 7.3 | 19.2 |
| 8 | 79 | 1,101 | 47.6 | 60 | 62.7 | 76 | 8.2 | 21.0 |
| 9 | 101 | 1,205 | 40.2 | 40 | 57.3 | 70 | 9.7 | 22.1 |
| 1960 | 97 | 1,045 | 23.1 | 24 | 47.2 | 49 | 11.5 | 23.4 |
| 1 | 106 | 1,050 | 14.2 | 13 | 35.3 | 40 | 13.1 | 24.7 |
| 2 | 137 | 1,070 | 9.5 | 7 | 31.1 | 31 | 15.6 | 25.6 |
| 3 | 141 | 1,090 | 3.1 | 2 | 31.1 | 10 | 17.7 | 26.4 |
| 4 | 162 | 1,110 | 4.7 | 3 | 36.3 | 13 | 20.4 | 26.7 |
| 5 | 170 | 1,160 | 4.3 | 3 | 36.2 | 12 | 22.6 | 27.2 |
| 6 | 202 | 1,100 | 4.2 | 2 | 27.6 | 16 | 24.8 | 27.5 |
| 7 | 215 | 1,100 | 2.4 | 1 | 16.0 | 15 | 27.8 | 27.2 |
| 8 | 162 | 1,124 | 1.3 | 1 | 15.3 | 8 | 29.2 | 28.5 |
| 9 (6 mos.) | | | | | | | | |
| Source | (12) | (2) | (3) | | (10) | | (4) | (2) |

# TABLE 6
## FREEZERS
### U.S.–Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 301 | 165E | | | n.a. | *1.070* | *22.5* | n.a. | 325 |
| 1 | 324 | 175E | | | n.a. | *1.052* | *22.5* | n.a. | 360 |
| 2 | 296 | 177E | | | 266 | *.979* | *20.0* | 226 | 370 |
| 3 | 284 | 176E | | | 263 | *.983* | *20.0* | 223 | 400 |
| 4 | 265 | 174 | | | 250 | *.973* | *20.0* | 216 | 395 |
| 5 | 252 | 176E | | | 236 | *.986* | *20.0* | 204 | 400 |
| 6 | 250 | 175E | | | 212 | *.984* | *20.0* | 185 | 390 |
| 7 | 221 | 170E | | | 200 | *.959* | *20.0* | 183 | 375 |
| 8 | 212 | 162 | | | 199 | *.971* | *20.0* | 177 | 350 |
| 9 | 199 | 170 | | | 200 | *.959* | *20.0* | 181 | 329 |
| 1960 | 184 | 173 | | | 205 | *.970* | *20.0* | 175 | 295 |
| 1 | 174 | 135 | 141 | 33 | 209 | *1.013* | *20.0* | 169 | 279 |
| 2 | 161 | 137 | 137 | 24 | 218 | *1.069* | *20.0* | 167 | 265 |
| 3 | 162 | 132 | 134 | 28 | 226 | *1.078* | *20.0* | 163 | 254 |
| 4 | 148 | 140 | 128 | 20 | 197 | *1.079* | *20.0* | 161 | 236 |
| 5 | 139 | 140 | 127 | 12 | 220 | *1.078* | *20.0* | 170 | 234 |
| 6 | 139 | 139 | 128 | 11 | 222 | *1.077* | *20.0* | 171 | 232 |
| 7 | 138 | 137 | 127 | 11 | 294 | *1.079* | *20.0* | 201 | 233 |
| 8 | | 140 | 126 | | 254 | *1.078* | *20.0* | 185 | 233 |
| 9 (6 mos.) | | 145 | | | 236 | *1.077* | *20.0* | | |
| Source | (11) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data were obtained by averaging the unit production costs of two manufacturers whose output was a relatively small percentage of total Canadian production. Figures for 1964 and earlier relate to one company only, whose costs were lower than the second company involved.

CHART 7
FREEZERS

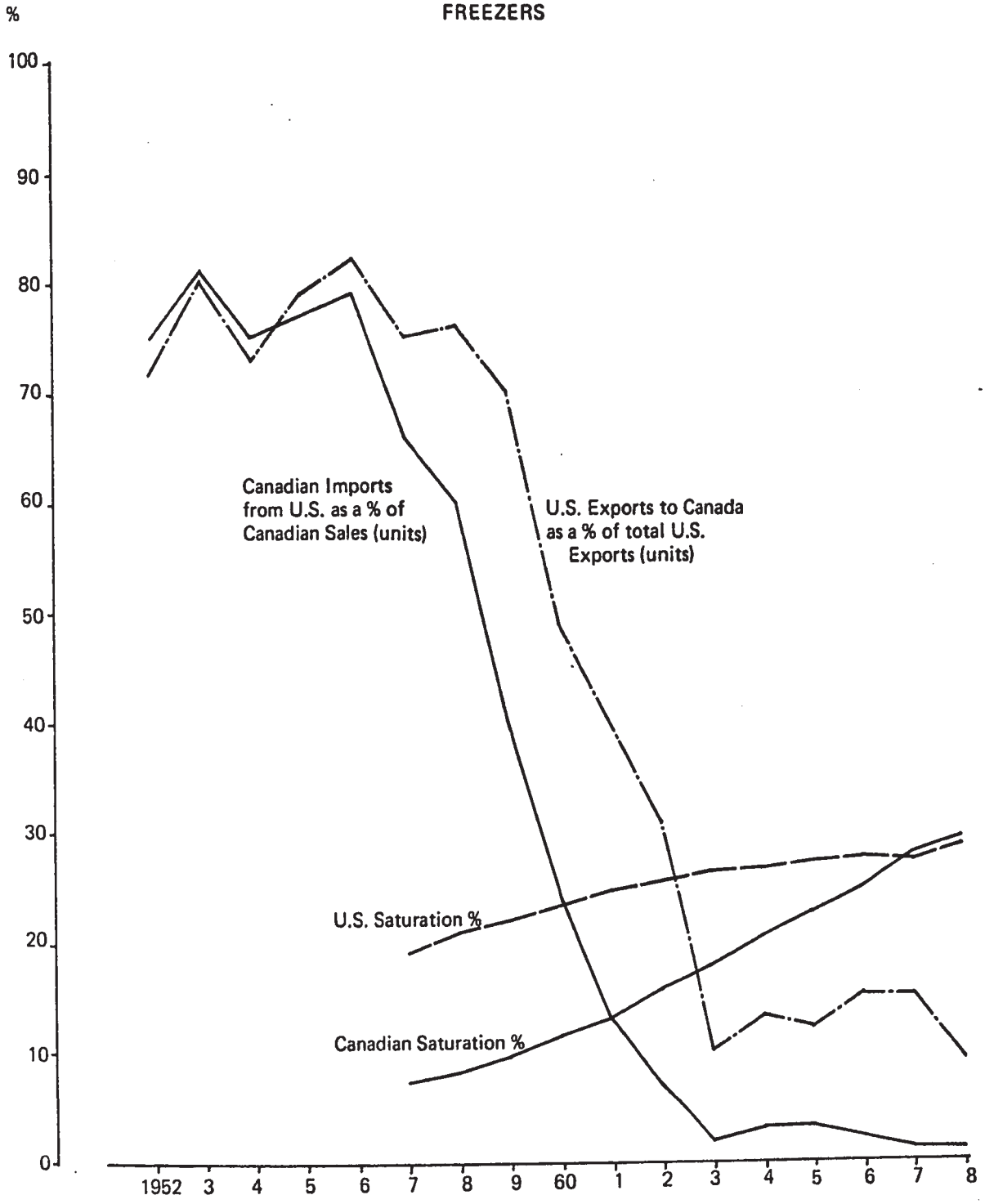
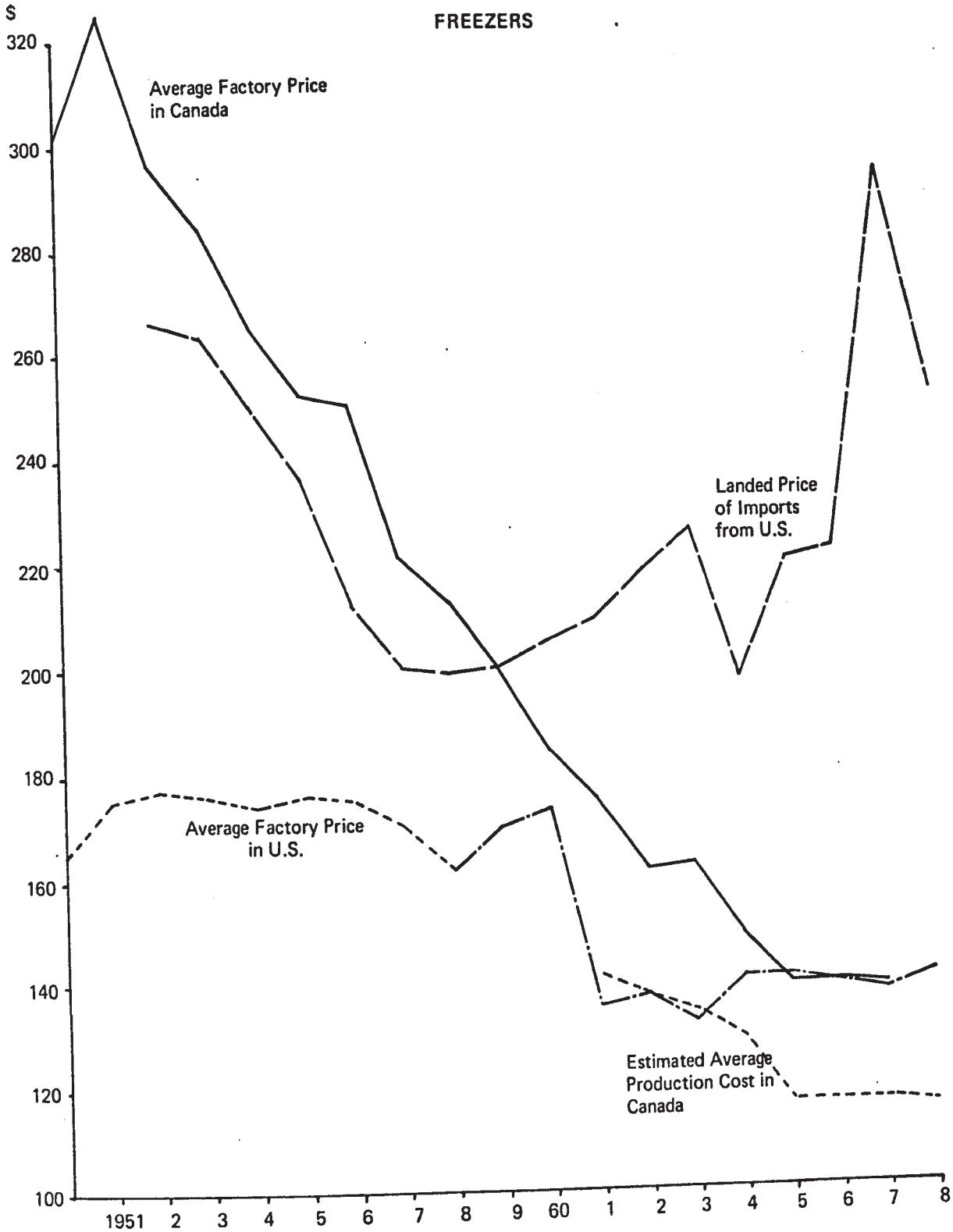


CHART 8
FREEZERS



# CHAPTER VIII

## AUTOMATIC WASHERS

Since the automatic washer was first introduced into Canada in 1949, it has steadily displaced sales of the conventional wringer washer. However, it was not until 1966 that sales of automatics actually exceeded sales of wringers. Again the automatic was a U.S. innovation, and in that country the speed of displacement of wringers was much more rapid. Unfortunately U.S. saturation statistics for wringers and automatics are combined in most publications, but U.S. manufacturers were selling more automatics than wringers as early as 1952. The U.S. saturation figures shown on Chart 9 were supplied by a U.S. manufacturer, and indicate how much more saturated the U.S. market is in comparison to the Canadian market.

Earliest available statistics indicate that some 30,000 automatic washers were manufactured in Canada in 1950 (see Table 7). Imports from the U.S. for that year amounted to only 80 units and 453 units for 1951. These low levels were due to the imposition of a trade embargo

from 1948 to 1951, which forced U.S. producers to manufacture in Canada at a time when they would normally have exported. In 1952, 5,700 units were imported from the United States - about 18% of total sales - and by 1954 imports were accounting for 34% of automatic washers sold in Canada. Imports remained at about this percentage until 1961 at which time further displacement began to occur, reducing imports to 8% by 1965. This trend is graphically depicted in Chart 9.

Imports of washing machine parts into Canada have followed an equally interesting trend. Although they have risen substantially in total dollars - from $2.8 millions in 1950 to $8.2 millions in 1968 (Table 7) - they have declined steadily in terms of imports per unit manufactured in Canada. This decline, from $93 per unit in 1950 to $37 per unit in 1968 (see Chart 10), is a further indication of the gradual integration of Canadian manufacturing facilities over time. It is a pattern that again was strongly confirmed by executives of responding companies. Most Canadian manufacturers currently import mechanisms - a $20 item per unit - and a number of other miscellaneous parts. It is possible that the figures published include both repair parts and component parts and perhaps the occasional wringer washer part. The classification is headed: "parts for electric household washing machines". However, the trend over time is of more interest than the absolute dollar

amount, which may be inaccurate.

Industry forecasts in 1968 called for an average annual sales growth of 7.5% over the next six years with continued heavy displacement of wringer washers. Judging from the annual sales data in Table 7 and these forecasts, automatic washers would appear to be facing the gradually slower growth characteristic of entry into the maturity stage. On this basis we would expect to see some evidence of a decline in gross margins. What the data in Table 8 seem to show is a rather low average gross margin in 1956 to $25 per unit rising to $63 by 1960. From 1960 on, the gross margin did in fact decline steadily to $38 in 1967 and then rose to $41 in 1968. The low margin in the earlier years was somewhat unexpected, but is not difficult to understand given the high level of component parts imports at this time. Since materials comprise between 60%-70% of total production costs, manufacturers' costs were virtually controlled from outside, while price was partly held back by problems of slow displacement of wringers. Also, most manufacturers had very little invested in these early years and could therefore manage on lower margins. However, as integration took place, and more capital was invested, margins would have to rise in order to yield a return on the investment.

From the year 1960, when gross margins rose to their highest levels and some degree of production inte-

gration had occurred, both prices and costs began a steady decline until 1964, when both began to increase. Average price moved from $197 in 1960 to $171 in 1964, a decline of $26, and then proceeded to rise by $14 to $185 by 1968. Average costs followed a similar pattern dropping from $134 in 1960 to $130 in 1964, a decline of only $4 and then rising by $14 to $144. From 1964 on, a number of additional features were added which became standard on an increasing volume of models. These included self-cleaning filters, wash-and-wear cycles, and cold water wash cycles (e.g., multi-speed washers constituted 38.9% of the auto washer market in 1964, and 61.9% by 1968). Naturally, the addition of these features, along with general inflation and wage pressure, added significantly to costs, and at the same time helped to induce consumers to pay higher prices, as the following data show.

PRICE COMPOSITION OF CANADIAN SALES OF AUTOMATIC WASHERS

| | 1963 | 1965 | 1967 | 1968 |
|---|---|---|---|---|
| Under $180 | 41% | 42% | 41% | 33% |
| $180 - $200 | 25 | 30 | 23 | 32 |
| $200 - $230 | 25 | 20 | 30 | 27 |
| Over $230 | 9 | 8 | 6 | 8 |
| | 100% | 100% | 100% | 100% |

The above prices are based on distributor levels and include imported units. They do not therefore coincide with

figures in Table 7 on factory price, but they do follow the same pattern and indicate the consumer move to higher price levels from 1965 on.

One other factor pressing average factory prices steadily in the opposite direction is the general swing in distribution patterns away from dealers and towards department stores and builders. To the extent that manufacturers' marketing costs are reduced when dealing with builders and department stores, any trend towards these channels would effect downward pressure on average factory prices. The following figures illustrate the trend for automatic washers. Note how much greater a percentage of the market department and chain stores hold in comparison to their share in less mature products such as air conditioners and dishwashers outlined earlier!

CANADIAN SALES OF AUTOMATIC WASHERS
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 51.2% | 49.5% | 46.5% |
| Dept. and chain stores | 43.6 | 44.5 | 46.4 |
| Builders | 5.2 | 6.0 | 7.1 |
| | 100.0% | 100.0% | 100.0% |

It is interesting to note, from Table 8, the decreasing factory price level in the United States, and the huge production volume in that country (Table 7) - far in

excess of ten times Canadian production. Clearly the U.S. enjoys vastly more advantageous scale economies than Canada and much lower production costs and factory prices (see Chart 11). Nevertheless U.S. manufacturers did not attempt to underprice the Canadian market with exports. On the contrary the average price of their exports to Canada after exchange and duty was always considerably above Canadian production costs and above the average Canadian factory price from 1962 on. Table 8 indicates further that the average U.S. export price on washers was higher than the average U.S. factory price for all recorded years. Again this high export price reflected in part the occasional import by subsidiaries of top-of-the-line models, and more importantly, in the case of automatic washers, the effect of one unusual major exporter in Maytag who had captured about 8% of the Canadian market in 1968.

The Maytag organization had an aggressive marketing operation in Canada, but exported all its products from the U.S. in spite of the tariff. The retail price of a Maytag in Canada was considerably higher than any other brand. The tariff was thus effectively passed on to the Canadian consumer. This was done by the development of a powerful brand image and high quality reputation, and required a large marketing investment in the form of direct consumer advertising and semi-exclusive dealerships. This marketing-oriented approach to the industry has put Maytag in number

one position among U.S. appliance makers in terms of return on invested capital.

# TABLE 7
## AUTOMATIC WASHERS
### U.S.—Canadian Industry Statistics

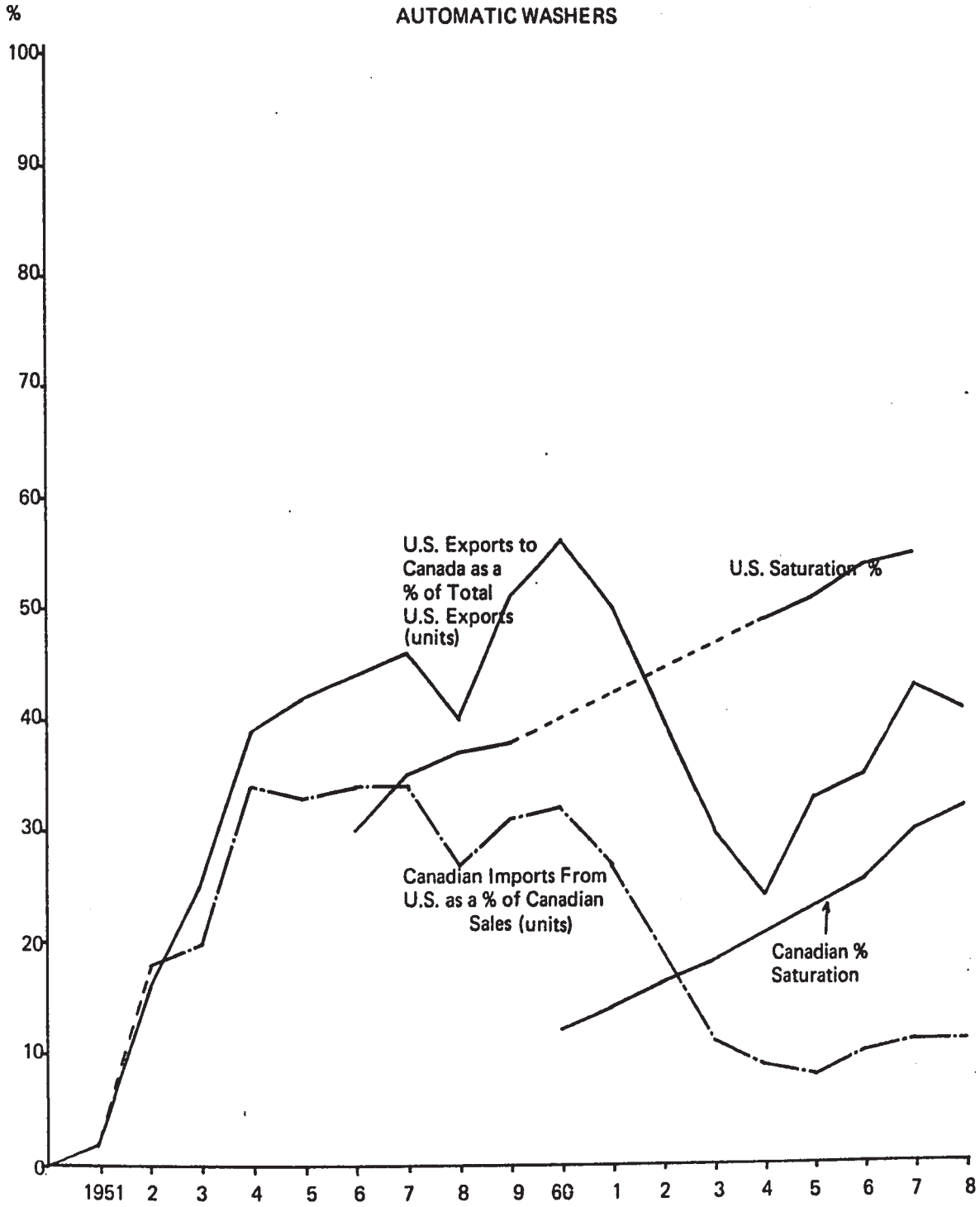
| | Industry Unit Sales | | Can. Imports From U.S. | | Total U.S. Exports | U.S. Exports to Canada as a % of Total | Saturation % | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Units 000's | % Imports to Can. Sales | Units 000's | U.S. Exports | Can. | U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | 30.4 | 1,646 | .0 | 0 | 27.0 | 0 | | | 2,840 | 93 |
| 1 | 27.4 | 1,589 | .5 | 2 | 35.2 | 2 | | | 2,700 | 100 |
| 2 | 32.2 | 1,684 | 5.7 | 18 | 34.8 | 16 | | | 2,225 | 84 |
| 3 | 32.8 | 2,071 | 6.4 | 20 | 25.1 | 25 | | | 3,000 | 114 |
| 4 | 41.9 | 2,401 | 14.3 | 34 | 36.9 | 39 | | | 2,400 | 87 |
| 5 | 55.3 | 3,123 | 18.5 | 33 | 43.6 | 42 | | | 2,980 | 81 |
| 6 | 75.0 | 3,314 | 25.3 | 34 | 58.0 | 44 | | 30 | 3,900 | 78 |
| 7 | 79.6 | 2,814 | 27.0 | 34 | 59.2 | 46 | | 35 | 3,190 | 61 |
| 8 | 82.2 | 2,832 | 21.9 | 27 | 54.2 | 40 | | 37 | 3,300 | 55 |
| 9 | 111.2 | 2,970 | 34.5 | 31 | 67.2 | 51 | | 38 | 4,070 | 53 |
| 1960 | 111.1 | 2,601 | 35.8 | 32 | 64.3 | 56 | 12.2 | | 3,740 | 50 |
| 1 | 116.4 | 2,710 | 32.0 | 27 | 63.7 | 50 | 14.2 | | 3,920 | 46 |
| 2 | 116.9 | 3,040 | 22.5 | 19 | 56.5 | 40 | 16.5 | | 5,000 | 53 |
| 3 | 135.8 | 3,296 | 14.3 | 11 | 48.4 | 30 | 18.3 | | 6,220 | 51 |
| 4 | 159.1 | 3,541 | 14.4 | 9 | 59.3 | 24 | 20.7 | 49 | 6,710 | 46 |
| 5 | 193.1 | 3,771 | 15.8 | 8 | 47.2 | 33 | 23.1 | 51 | 7,130 | 40 |
| 6 | 221.5 | 3,930 | 22.9 | 10 | 64.6 | 35 | 25.6 | 54 | 8,580 | 43 |
| 7 | 223.1 | 3,878 | 24.9 | 11 | 58.1 | 43 | 30.0 | 55 | 8,370 | 42 |
| 8 | 250.2 | 4,103 | 28.2 | 11 | 68.0 | 41 | 32.0 | | 8,170 | 37 |
| 9 | | | | | | | | | | |
| Source | (12) | (2) | (3) | | (10) | | (4) | (2) | (3) | |

# TABLE 8
## AUTOMATIC WASHERS
## U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | | 130E | | | 243 | *1.070* | *22.5* | 141 | 258 |
| 1 | 200 | 140E | | | 184 | *1.052* | *22.5* | 142 | 281 |
| 2 | 185 | 140E | | | 176 | *.979* | *22.5* | 144 | 280 |
| 3 | 198 | 140E | | | 190 | *.983* | *22.5* | 165 | 280 |
| 4 | 195 | 136E | | | 193 | *.973* | *22.5* | 165 | 272 |
| 5 | 193 | 135E | | | 174 | *.986* | *22.5* | 150 | 270 |
| 6 | 186 | 140 | 161 | 25 | 164 | *.984* | *22.5* | 143 | 275 |
| 7 | 195 | 147 | 158 | 37 | 183 | *.959* | *22.5* | 154 | 280 |
| 8 | 200 | 146 | 150 | 50 | 194 | *.971* | *22.5* | 152 | 280 |
| 9 | 190 | 146 | 138 | 52 | 180 | *.959* | *22.5* | 149 | 280 |
| 1960 | 197 | 140 | 134 | 63 | 177 | *.970* | *22.5* | 147 | 268 |
| 1 | 194 | 136 | 136 | 58 | 180 | *1.013* | *22.5* | 144 | 258 |
| 2 | 189 | 133 | 135 | 54 | 190 | *1.069* | *22.5* | 150 | 254 |
| 3 | 185 | 131 | 134 | 51 | 200 | *1.078* | *22.5* | 153 | 251 |
| 4 | 171 | 130 | 130 | 41 | 201 | *1.079* | *22.5* | 146 | 249 |
| 5 | 172 | 128 | 135 | 37 | 202 | *1.078* | *22.5* | 150 | 243 |
| 6 | 175 | 127 | 138 | 37 | 189 | *1.077* | *22.5* | 140 | 242 |
| 7 | 180 | 128 | 142 | 38 | 188 | *1.079* | *22.5* | 140 | 245 |
| 8 | 185 | 130 | 144 | 41 | 197 | *1.078* | *22.0* | 141 | 248 |
| 9 | | 131 | | | | *1.077* | *20.0* | | |
| Source | (11) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of four manufacturers whose output represented 65-70% of units made in Canada in 1968. For 1963 through 1961 data from three companies were used, and prior to 1961 only two companies. It is not felt that the average has suffered greatly as a result of the changing inputs. If anything earlier costs may be slightly understated.

CHART 9
AUTOMATIC WASHERS



## CHART 10
## AUTOMATIC WASHERS

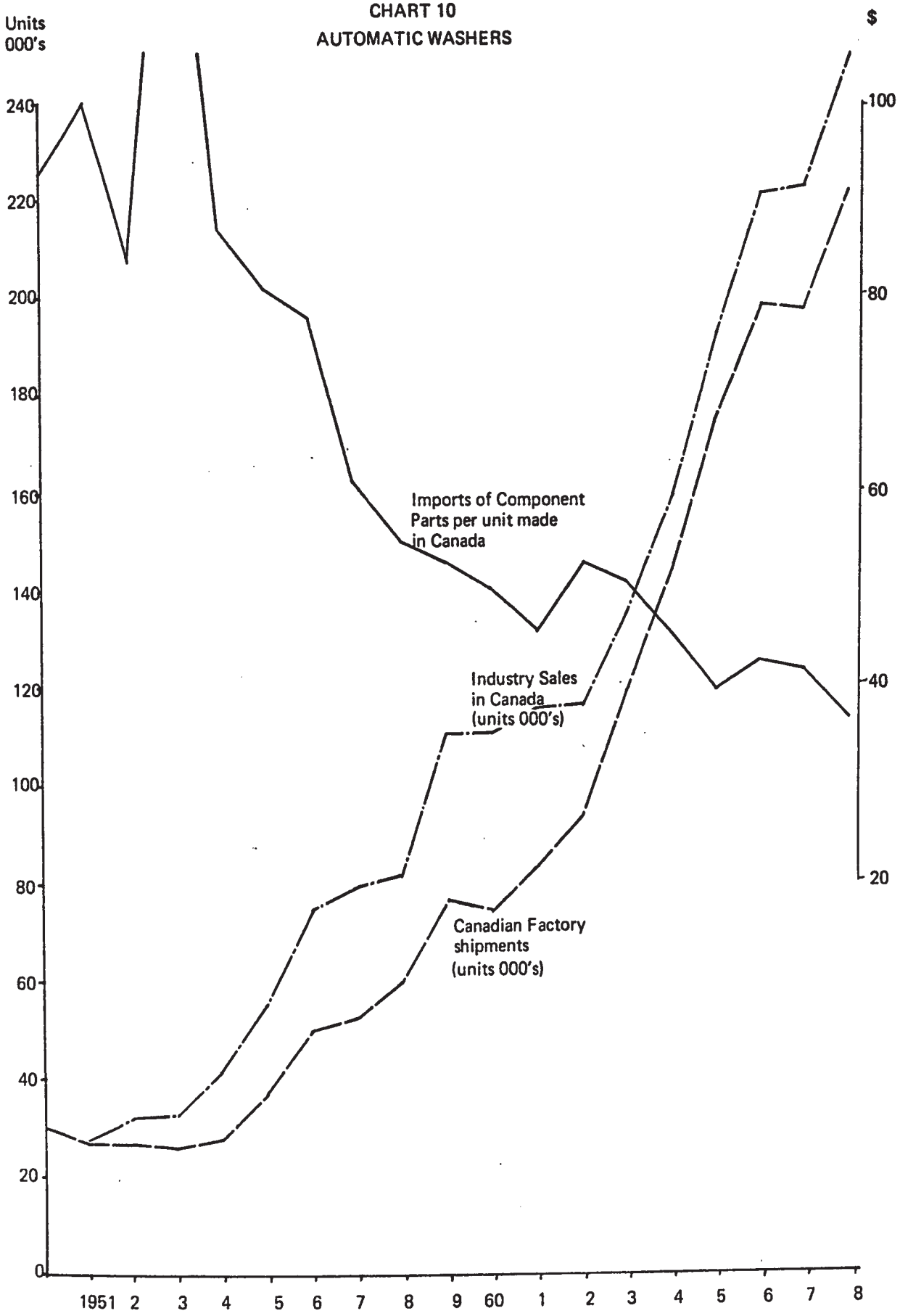
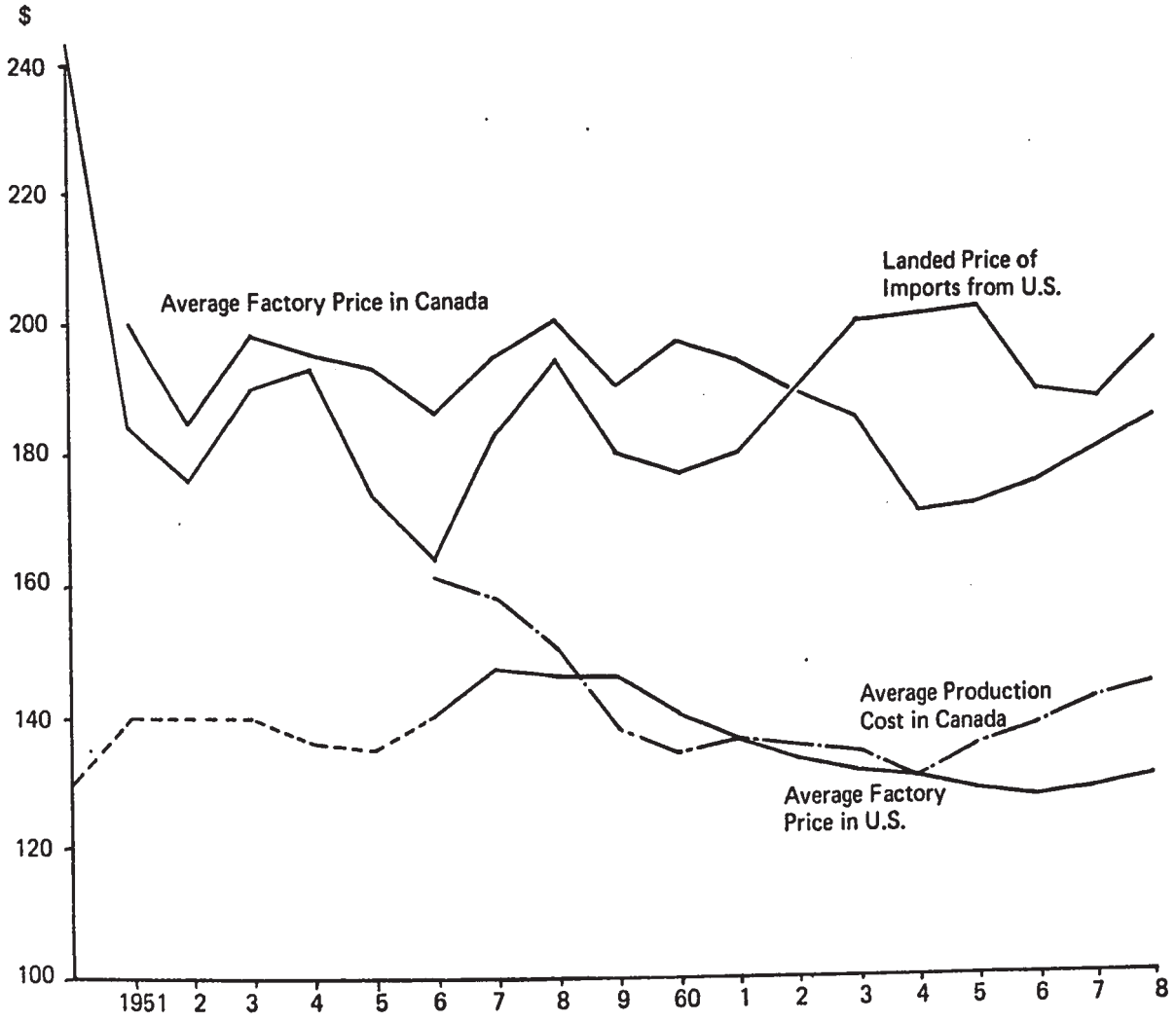


CHART 11
AUTOMATIC WASHERS



## CHAPTER IX

## WRINGER WASHERS AND TWIN-TUBS

Published statistics in Canada combine data on wringer washers and twin-tub washer-dryer combinations despite substantial differences in the two products. For purposes of this study, the main difference is that they are at opposite ends of their life cycle. The twin-tub was introduced into the Canadian market by a major British subsidiary as recently as 1964, whereas the wringer washer was manufactured in Canada in large volume as early as 1930 and is now in its decline phase due to displacement by automatics. It was therefore imperative to separate statistics on the two products in order to observe these opposite trends; this was done by the use of estimates from firms involved in the industry.

The data in Tables 9 and 10 were assembled mainly from published statistics except that Canadian figures for 1965-68 were adjusted to exclude twin-tub sales. Chart 14 shows the remarkable sales growth of the twin-tub since 1964, contrasting this with the sharp decline in wringer

washer sales.

In 1947 it appears that over 60,000 wringer washers were imported by Canadian firms from the U.S. - approximately 25% of Canadian sales. The trade embargo from 1948-1951 caused the virtual disappearance of imports, as mentioned previously, and the following years saw imports recover somewhat. However, in the case of wringer washers, a product then in its late maturity phase, imports never rose above the 9% recorded in 1953 (see Table 9) and declined to negligible proportions thereafter. Chart 12 depicts this situation in relation to the decline in saturation levels in both Canada and the U.S., showing also the significantly more advanced saturation decline in the U.S. By 1956, Canada had in fact become a net exporter of wringer washers in total although not in relation to the United States alone. Our exports had gone mainly to Latin America and the Middle East, as the following figures indicate.

These figures are revealing in terms of the export strategy of Canadian firms. It is unfortunate that automatic washers are included with wringers in DBS export statistics, since this tends to mask two important points. First is that Canada is a net exporter of wringers (the declining product) and a net importer of automatics (the newer product). Second, Canadian firms tend to export wringers from the bottom end of their product line at prices below the average Canadian factory price, despite the ad-

CANADIAN EXPORTS OF WRINGER WASHERS BY DESTINATION

| | 1956 | | 1959 | | 1962 | | 1965 | | 1968 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Units | Price | Units | Price | Units | Price | Units | Price | Units | Price |
| Latin America | 5,519 | $82 | 5,278 | $87 | 4,566 | $86 | 9,101 | $80 | 9,505 | $86 |
| Middle East | 1,839 | 84 | 2,408 | 81 | 1,913 | 91 | 1,951 | 88 | 6,850 | 100* |
| Europe | | | | | 938 | 198* | 7,633 | 90* | 1,397 | 245* |
| Total | 11,415 | $83 | 10,139 | $85 | 12,143 | $100* | 29,066 | $87* | 26,011 | $102* |

* Includes a number of automatics

Source: D.B.S. 65-004, Washing Machines, Domestic, Electric: 5 largest receiving countries.

SELECTED CANADIAN TRADE STATISTICS ON WASHING MACHINES

| | Wringer Washers | | | | | Automatic Washers | |
|---|---|---|---|---|---|---|---|
| | Imports | Exports | Average Export Price | Average Prod. Cost | Average Factory Price | Imports | Exports |
| 1956 | 7,999 | 11,415 | $83 | $72 | $94 | 25,281 | NIL |
| 1959 | 8,221 | 10,139 | 85 | 78 | 87 | 34,511 | NIL |
| 1962 | 4,361 | 10,463 | 85 | 69 | 87 | 22,453 | 1,680 |
| 1965 | 3,400 | 26,326 | 72 | 71 | 85 | 15,833 | 2,740 |
| 1968 | 2,344 | 23,411 | 86 | 84 | n/a | 28,206 | 2,600 |

N.B. From 1962 on, it is known that some automatics were exported. The method used to separate them from wringers was as follows: (1) calculate export price of wringers by averaging the price of the two lowest prices among the top five receiving countries; (2) calculate export price of automatics by reference to exports to the U.K.; (3) allocate volume in accordance with total exports (units and value).

ditional costs involved in exporting. It appears likely that Canadian firms have achieved exports at the expense of their gross margins (i.e., they have used a variable cost approach to exporting).

Company executives indicated that most components for wringers were sourced or manufactured in Canada. Those components that are imported are probably included in the imported components for automatics. However, there remained very little difference in design or performance between U.S. and Canadian models. Canadian producers lacked any distinctive product advantage. Furthermore, it is quite clear from Table 9 that the market in both Canada and the U.S. was rapidly disappearing. Most major appliance makers moved away from the manufacture of wringers some years ago and those that remained faced continually falling prices and tightening margins. The product appeared to be sold entirely on the basis of price and behaved much like a commodity item. It is ironically a part of my thesis that Canadian companies ultimately assume control of a product only as subsidiaries and U.S. exporters relinquish their interest in it, which normally coincides with the product's decline in sales and profitability.

By 1968, for example, between 80-90% of all wringers made in Canada were manufactured by Canadian owned firms. As with freezers, the incidence of private and stencil brands had increased, and accounted for approximately 45%

of the total Canadian production in 1968. This trend had, of course, contributed to the low margins available on this product. The actual margin position was probably somewhat worse than that shown in Table 10, since estimated production costs are known to be somewhat understated. It is also known that, in 1968, a large percentage of wringer washers was manufactured in old, fully-depreciated facilities and that production costs seldom included adequate allowance for replacement of fixed assets. When a product is in its decline stage, severe pressure on gross margins can be expected unless firms drop out of competition more rapidly than the market declines.

The wringer washer and the twin-tub had also been affected by shifts in distribution patterns in Canada with department and chain stores taking increasing shares of the market. It was felt by industry executives that department and chain stores held a much larger share of wringer washer sales than of twin-tubs, which required a somewhat more personalized and imaginative sales approach, but separate figures could not be obtained. Builders on the other hand were seldom interested in either product; they normally installed automatic washers and dryers.

It is interesting again to note the relative price patterns between Canada and the U.S. on Chart 13. Average factory prices between the two countries can be seen to be gradually converging together over time. Again it would

CANADIAN SALES OF WRINGER WASHERS
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 54.5% | 54.0% | 52.2% |
| Dept. and chain stores | 44.0 | 44.6 | 46.6 |
| Builders | 1.5 | 1.4 | 1.2 |
| Total | 100.0% | 100.0% | 100.0% |

be interesting to know to what extent Canada's apparent price competitiveness is due to the very high incidence of private and stencil brand sales. Neither country was in a position to underprice the other via exports because margins were too low to absorb the tariff, and since the product sold largely on price, very little trade could take place. For example, the Maytag organization, which dominated wringer washer production in the U.S., and successfully sold automatic washers and dryers at a price premium in Canada, had been unable to penetrate the Canadian wringer washer market. The average landed cost of the small number of units Canadians did import was substantially higher than both the average Canadian production cost and the average factory price, as Chart 13 depicts. Again the average price of total U.S. exports was regularly higher than the average U.S. factory price (see Table 10). Even when a product has reached a stage of high price elasticity, it seems U.S. companies do not try to underprice in foreign markets. It is not difficult to understand why firms would avoid trying

to obtain exports at the price of lower margins, especially on already low-margin products.

The twin-tub machine was clearly in its growth stage in Canada with a growth rate since 1965 that was unprecedented in the appliance industry. The twin-tub was a British innovation manufactured for the needs of the European market. It consisted of a small automatic washer and spin dryer combined into one portable unit. Its major appeal in Canada was to apartment dwellers who shared communal laundry facilities, which they tended to use only on scheduled occasions. The twin-tub allowed them to handle small loads frequently and conveniently. Following a period of exports to Canada prior to 1965, the exact quantity of which could not be obtained, a major British producer established a manufacturing subsidiary in Canada which still controls a major share of the market. Other British producers tried to export to Canada but without notable success until certain Canadian producers made arrangements with them to take over marketing in Canada. In 1968, imports of twin-tubs from the U.K. were estimated at 40,700 units, or 35% of total Canadian sales. This marketing effort proved very profitable to the Canadian firms involved, and in 1969 they were reported eyeing the U.S. market where twin-tubs have not taken hold - apparently due in part to poor marketing strategy.

In effect the twin-tub began as a wholly imported

product in small volume. Then the innovating country - the U.K. on this occasion - introduced production into Canada via a subsidiary. Imports from other U.K. producers were still growing. It was not known to what extent the subsidiary had imported component parts from its U.K. parent. Canadian importers were reportedly considering a shift to produce under license in Canada, since volume had grown so rapidly. They would then become major importers of component parts until they were in a position to displace them by sourcing in Canada or making them themselves. The profitability of this product remained very attractive with margins per unit higher than automatic washers. The jump in average price in 1968 (see Chart 14) reflected the higher price of the 40,700 imported units. This price premium was sustained in part by product features (agitator washing action), but also reflected the low price elasticity common in new products. It now seems possible that Canadian producers will become exporters of twin-tub machines to the U.S. purely on the basis of their marketing acumen.

# TABLE 9
## WRINGER WASHERS
## U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | |
|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. |
| 1950 | 255 | 2,626 | 1.6 | 1 | 26 | 6 | | |
| 1 | 201 | 1,795 | 2.8 | 1 | 27 | 10 | | |
| 2 | 223 | 1,582 | 6.7 | 3 | 26 | 26 | | |
| 3 | 231 | 1,521 | 19.8 | 9 | 55 | 36 | | |
| 4 | 202 | 1,209 | 9.4 | 5 | 43 | 22 | | |
| 5 | 248 | 1,268 | 10.8 | 4 | 39 | 28 | | |
| 6 | 259 | 1,228 | 8.0 | 3 | 34 | 24 | | 44 |
| 7 | 229 | 977 | 8.2 | 4 | 32 | 26 | | 40 |
| 8 | 242 | 938 | 8.2 | 4 | 34 | 24 | | 37 |
| 9 | 254 | 980 | 8.2 | 3 | 36 | 23 | | 36 |
| 1960 | 218 | 763 | 6.4 | 3 | 31 | 21 | 75 | |
| 1 | 215 | 734 | 4.4 | 2 | 30 | 15 | 72 | |
| 2 | 211 | 755 | 4.4 | 2 | 32 | 14 | 70 | |
| 3 | 229 | 734 | 3.1 | 1 | 33 | 9 | 68 | |
| 4 | 239 | 649 | 4.3 | 2 | 44 | 10 | 66 | 23 |
| 5 | 226 | 659 | 3.4 | 2 | 39 | 9 | 63 | 21 |
| 6 | 193 | 516 | 3.9 | 2 | 54 | 7 | 60 | 19 |
| 7 | 152 | 445 | 2.3 | 2 | 43 | 5 | 55 | 17 |
| 8 | 119 | 380 | 2.3 | 2 | 50 | 5 | 52 | |
| 9 (6 mos.) | | 157 | .9 | | 19 | 5 | | |
| Source | (12) | (2) | (3) | | (10) | | (4) | (7) |

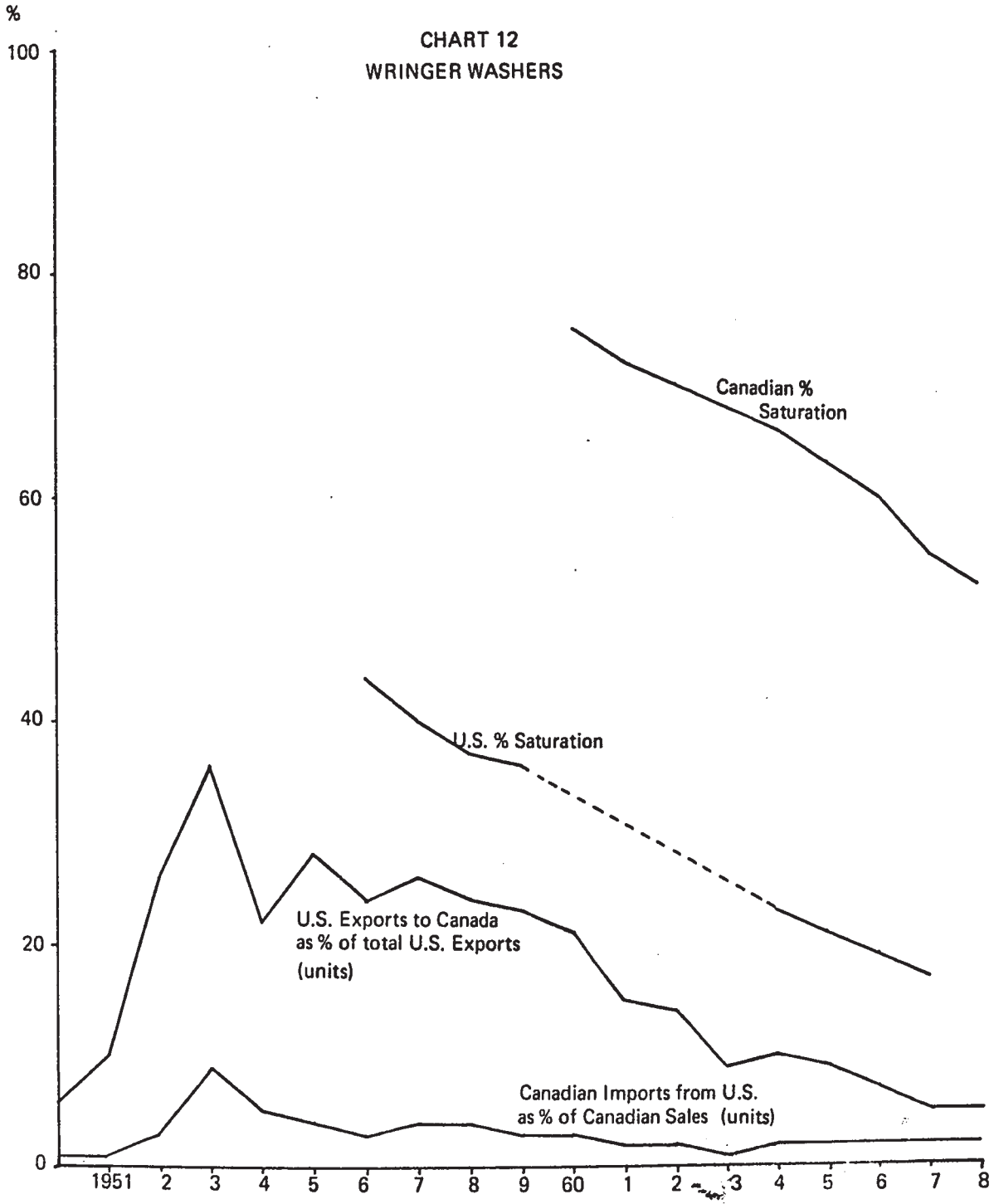
# TABLE 10
## WRINGER WASHERS
### U.S.–Canadian Price Statistics

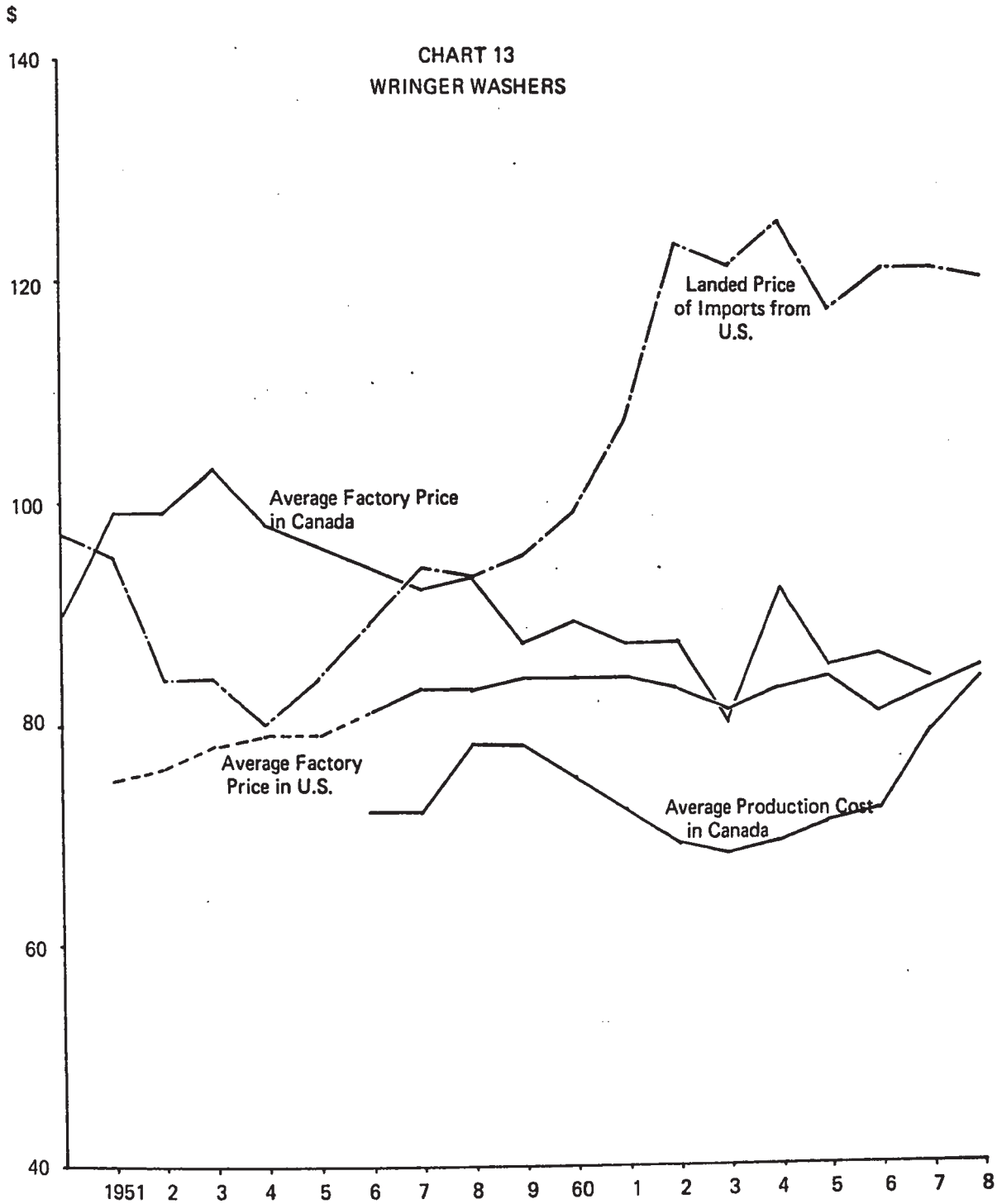
| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 90 | 70E | | | 97 | *1.070* | *22.5* | 87 | 138 |
| 1 | 99 | 75E | | | 95 | *1.052* | *22.5* | 95 | 150 |
| 2 | 99 | 76E | | | 84 | *.979* | *22.5* | 91 | 150 |
| 3 | 103 | 78E | | | 84 | *.983* | *22.5* | 84 | 150 |
| 4 | 98 | 79E | | | 80 | *.973* | *22.5* | 88 | 149 |
| 5 | 96 | 79E | | | 84 | *.986* | *22.5* | 83 | 147 |
| 6 | 94 | 81 | 72 | 22 | 89 | *.984* | *22.5* | 93 | 151 |
| 7 | 92 | 83 | 72 | 20 | 94 | *.959* | *22.5* | 95 | 155 |
| 8 | 93 | 83 | 78 | 15 | 93 | *.971* | *22.5* | 88 | 155 |
| 9 | 87 | 84 | 78 | 9 | 95 | *.959* | *22.5* | 94 | 157 |
| 1960 | 89 | 84 | 75 | 14 | 99 | *.970* | *22.5* | 98 | 157 |
| 1 | 87 | 84 | 72 | 15 | 107 | *1.013* | *22.5* | 97 | 153 |
| 2 | 87 | 83 | 69 | 18 | 123 | *1.069* | *22.5* | 94 | 153 |
| 3 | 80 | 81 | 68 | 12 | 121 | *1.078* | *22.5* | 86 | 149 |
| 4 | 92 | 83 | 69 | 23 | 125 | *1.079* | *22.5* | 92 | 153 |
| 5 | 85 | 84 | 71 | 14 | 117 | *1.078* | *22.5* | 87 | 148 |
| 6 | 86 | 81 | 72 | 14 | 121 | *1.077* | *22.5* | 84 | 130 |
| 7 | 84 | 83 | 79 | 5 | 121 | *1.079* | *22.5* | 83 | 150 |
| 8 | | 85 | 84 | | 120 | *1.078* | *22.0* | 87 | 150 |
| 9 | | 87 | | | | *1.077* | *20.0* | | |
| Source | (11)* | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

*Excludes Twin-tub units

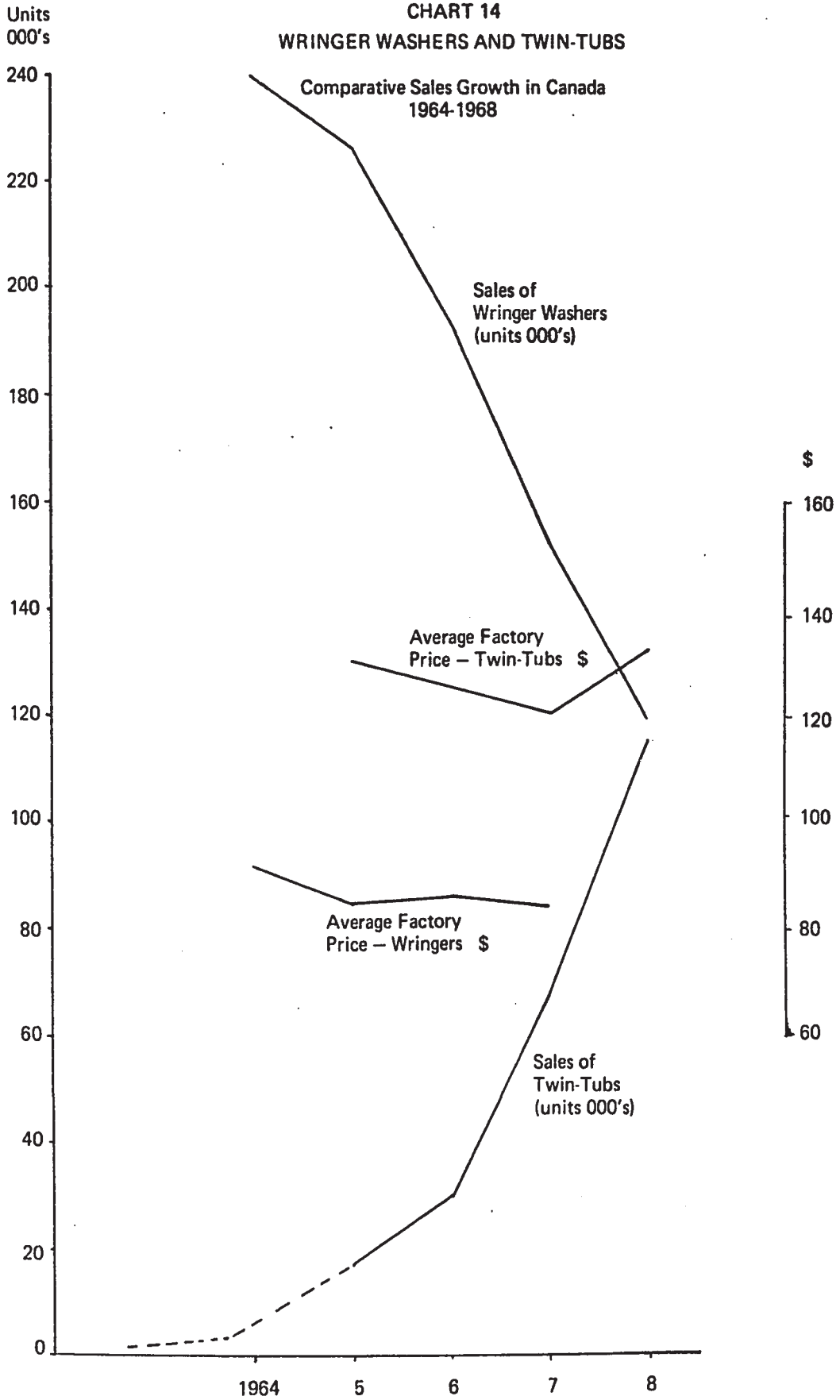
Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of three manufacturers whose output represented 45-50% of units made in Canada in 1968. Other Canadian producers are believed to have costs higher than the average shown above. The data for years prior to 1961 were taken from only one producer whose costs were generally below average. Hence margin figures are likely to be overstated.

CHART 12
WRINGER WASHERS




$
CHART 13
WRINGER WASHERS
140
120
100
80
60
40
Landed Price of Imports from U.S.
Average Factory Price in Canada
Average Factory Price in U.S.
Average Production Cost in Canada
1951
2
3
4
5
6
7
8
9
60
1
2
3
4
5
6
7
8

## CHART 14
## WRINGER WASHERS AND TWIN-TUBS



## CHAPTER X

## CLOTHES DRYERS

The sales pattern of the clothes dryer in the Canadian market has been very similar to that of the automatic washer. Introduced into Canada in 1950, two years after its introduction in the U.S., it was manufactured here as early as 1952. There are no statistics on sales volume or imports for 1950 or 1951, but industry sources say that whatever was sold was imported. In 1953, 16,800 dryers were made in Canada and company sources estimated that 5,000 were imported. From 1953 to 1959 sales volume grew rapidly at an average annual rate of 18.4% (see Table 11) while imports remained close to the 20% level. These imports were partly top-end models brought in by subsidiaries from U.S. parents and partly direct sales by Maytag importing from its U.S. plants. From 1959 through 1964, sales levelled off to a growth rate of only 3.5% and imports declined below the 10% level (Chart 15), representing mainly Maytag exports. Thus again we have a pattern of import displacement over time, which presumably would have been complete were it not for Maytag's unique marketing strength. The laid-down cost

of imports is now considerably above the average Canadian factory price and has been since 1963.

It was unfortunately impossible to obtain any reliable published figures on imports from the U.S. of component parts. Export statistics in the U.S. classified dryer parts under a heading "laundry equipment and parts", but the dollar amounts shown as exports to Canada were smaller than the value of dryer parts known to have been imported by just one Canadian producer. Canadian import statistics managed to add the value of some dryer parts to the value assigned to imported dryers, but not on any consistent basis. Data supplied by one producer in Canada indicated component imports of $18 per unit in 1968, down from $30 in 1966. There was general confirmation from industry executives that displacement had in fact been taking place over time. One company had recently invested in some special tooling and equipment in order to manufacture a part that was being imported, and took the occasion to express the hope that the tariff on components would remain long enough for him to generate a return on his investment.

Saturation for dryers reached 36.8% by 1968 as compared to 38.8% in the United States. Canadian saturation has in fact been close to the U.S. figure since 1963, reflecting, presumably, a higher ultimate saturation level in Canada due to climatic conditions. In this connection it is interesting to note from Chart 15 the very high per-

centage of U.S. dryer exports that flow into Canada. Industry forecasts in 1968 called for growth in Canadian sales over the next five years at an average of 6%, reaching 285,000 units by 1973. The dryer, like the automatic washer, appeared to be entering its maturity stage and declines in average price and cost levels should have occurred.

Before we examine the specific data, however, it is useful to point out that there are many important influences on average cost of production quite apart from economies of scale as the market expands. There are, of course, changes in factor costs such as wage rates and materials prices. One company estimated that prior to 1965 the average annual increase in materials prices was 1.5% and in wage rates between 2-3%. After 1965, these increases had accelerated to 2.5% and 6.5% respectively, and it had become increasingly difficult to absorb them by improvement in the scale or efficiency of operations. The same company, however, indicated that changes in model mix had a much greater impact on average unit costs of production. Most companies offer a full line of models, leaving the consumer to buy the features he desires, and when there is a general move towards higher-priced models by consumers, the result is higher unit production costs (and usually higher margins). Companies who recognize this often aim their advertising and promotion programs at top-of-the-line models, and attempt to market more through dealers, since builders and depart-

ment stores tend to favor low-end models.

In the case of electric dryers there was no pronounced move by consumers towards higher-priced models, as the following figures indicate.

PRICE COMPOSITION OF CANADIAN SALES OF ELECTRIC DRYERS

| | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|
| Less than $110 | 33.5% | 34.5% | 37.2% | 34.6% |
| $110 - $130 | 41.1 | 39.3 | 42.0 | 42.7 |
| Over $130 | 25.4 | 26.2 | 20.8 | 22.7 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |

There had, however, been a general move away from dealer sales towards builders and department stores. Hence some of the decline in factory prices and production cost was doubtless due to changes in distribution patterns, as the following data shows.

CANADIAN SALES OF ELECTRIC DRYERS BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 51.2% | 49.1% | 47.6% |
| Dept. and chain stores | 43.6 | 44.8 | 45.5 |
| Builders | 5.2 | 6.1 | 6.9 |
| Total | 100.0% | 100.0% | 100.0% |

Turning to Table 12, the average factory price of dryers made in Canada had in fact declined from $154 in 1953 to $111 in 1966, and production costs had undergone a similar decline. Gross margins followed the same pattern as automatic washers, rising to a peak in 1961 and declining thereafter. It is likely that the rise prior to 1961 reflected increasing levels of investment as Canadian production grew and imported components were displaced. Again it is worth reiterating that low-volume assembly operations require little investment and low margins may be more tenable in these early stages than they would be in later stages after larger capital expenditures have been made.

A comparison of U.S. shipments to Canadian shipments from Table 11 shows that Canadian sales exceeded 10% of U.S. sales in 1960-61 but declined thereafter to 8% by 1968. It is clear from Table 12 that there has been a substantial decline in U.S. unit prices over time - a drop of $47 per unit at retail from 1957-68, with a corresponding drop of $16 in factory prices. But this decline in price was not in evidence in U.S. exports to Canada, whose average price had fluctuated within narrow limits and without discernible trend.

Again, the Canadian laid-down cost of U.S. imports was considerably higher than average Canadian production cost for all years, and was higher than average Canadian factory price from 1962 on (see Chart 16). The U.S. clearly

had made no attempt to exploit its scale economies by under-pricing the Canadian market. What the data seem to support is the assertion by many industry executives that there is a tendency for Canadian firms to import top-of-the-line models whose market in Canada is relatively small. In addition, the Maytag organization had approximately 6% of the dryer market in Canada (variously estimated by Canadian industry executives), and followed a policy of pricing above the general market, passing the tariff on to the Canadian consumer. Maytag was in fact a major reason why the U.S. could export successfully to Canada at prices so much above the average Canadian production cost.

# TABLE 11
## CLOTHES DRYERS – GAS AND ELECTRIC
### U.S.–Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | |
|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Unit 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. |
| 1950 | | 318 | | | | | | |
| 1 | | 492 | | | | | | |
| 2 | | 635 | | | | | | |
| 3 | 21.8 | 737 | | | | | | |
| 4 | 25.8 | 941 | | | | | | |
| 5 | 48.7 | 1,397 | 10.6 (15) | 22 | | | | |
| 6 | 66.4 | 1,523 | 11.0 (15) | 17 | | | | |
| 7 | 78.6 | 1,294 | 12.6 (15) | 16 | | | | 13.7 |
| 8 | 101.1 | 1,240 | 16.0 | 16 | 17.9 | 90 | | 15.6 |
| 9 | 136.0 | 1,409 | 25.7 | 19 | 27.5 | 93 | | 17.8 |
| 1960 | 136.9 | 1,260 | 26.4 | 19 | 29.9 | 88 | 12.1 | 19.6 |
| 1 | 138.0 | 1,236 | 20.5 | 15 | 22.8 | 90 | 14.6 | 21.1 |
| 2 | 146.3 | 1,420 | 14.4 | 10 | 18.0 | 80 | 18.5 | 22.9 |
| 3 | 157.4 | 1,599 | 11.4 | 7 | 17.3 | 66 | 21.6 | 23.5 |
| 4 | 167.4 | 1,826 | 14.0 | 8 | 18.6 | 75 | 23.9 | 24.2 |
| 5 | 198.1 | 2,098 | 10.9 | 6 | 15.7 | 70 | 27.4 | 26.4 |
| 6 | 217.6 | 2,360 | 13.8 | 6 | 20.3 | 68 | 30.1 | 30.5 |
| 7 | 211.8 | 2,648 | 14.6 | 7 | 21.3 | 69 | 34.5 | 34.6 |
| 8 | | 2,862 | 20.7 | | 26.1 | 79 | 36.8 | 38.8 |
| 9 (6 mos.) | | 1,269 | 6.8 | | 17.6 | 39 | | |
| Source | (12) | (2) | (3)&(15) | | (10) | | (4) | (2) |

## TABLE 12
## CLOTHES DRYERS – GAS AND ELECTRIC
### U.S.–Canadian Price Statistics

| | Average Factory Price | | Average* Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | | | | | | | | | 221 |
| 1 | | | | | | | | | 245 |
| 2 | | | | | | | | | 256 |
| 3 | 154 | | | | | *.983* | *25.0* | | 244 |
| 4 | 145 | | | | | *.973* | *25.0* | | 229 |
| 5 | 137 | | | | | *.986* | *25.0* | | 221 |
| 6 | 140 | 111 | 112E | 28 | | *.984* | *25.0* | | 222 |
| 7 | 139 | 114 | 109E | 30 | | *.959* | *22.5* | | 229 |
| 8 | 132 | 114 | 103 | 29 | 130 | *.971* | *22.5* | 111 | 226 |
| 9 | 130 | 114 | 100 | 30 | 122 | *.959* | *22.5* | 106 | 235 |
| 1960 | 136 | 108 | 93 | 43 | 124 | *.970* | *22.5* | 105 | 207 |
| 1 | 130 | 105 | 86 | 44 | 120 | *1.013* | *22.5* | 99 | 198 |
| 2 | 126 | 101 | 85 | 41 | 128 | *1.069* | *22.5* | 100 | 194 |
| 3 | 121 | 99 | 84 | 37 | 139 | *1.078* | *22.5* | 103 | 190 |
| 4 | 113 | 97 | 79 | 34 | 145 | *1.079* | *22.5* | 112 | 175 |
| 5 | 110 | 96 | 80 | 30 | 157 | *1.078* | *22.5* | 123 | 175 |
| 6 | 111 | 97 | 81 | 30 | 145 | *1.077* | *22.5* | 119 | 179 |
| 7 | 115 | 96 | 84 | 31 | 145 | *1.079* | *22.5* | 119 | 179 |
| 8 | | 98 | 84 | | 133 | *1.078* | *22.0* | 108 | 182 |
| 9 (6 mos.) | | 99 | | | | *1.077* | *20.0* | | |
| Source | (11) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

*Electric only.

Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of four manufacturers whose output represented 65-70% of units made in Canada in 1968. The data for years prior to 1964 were taken from three companies and prior to 1961 from two. The average does not seem to have been unduly biased by these changes.

# TABLE 12

## CLOTHES DRYERS – GAS AND ELECTRIC

### U.S.–Canadian Price Statistics

| | Average Factory Price | | Average* Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | | | | | | | | | 221 |
| 1 | | | | | | | | | 245 |
| 2 | | | | | | | | | 256 |
| 3 | 154 | | | | | *.983* | *25.0* | | 244 |
| 4 | 145 | | | | | *.973* | *25.0* | | 229 |
| 5 | 137 | | | | | *.986* | *25.0* | | 221 |
| 6 | 140 | 111 | 112E | 28 | | *.984* | *25.0* | | 222 |
| 7 | 139 | 114 | 109E | 30 | | *.959* | *22.5* | | 229 |
| 8 | 132 | 114 | 103 | 29 | 130 | *.971* | *22.5* | 111 | 226 |
| 9 | 130 | 114 | 100 | 30 | 122 | *.959* | *22.5* | 106 | 235 |
| 1960 | 136 | 108 | 93 | 43 | 124 | *.970* | *22.5* | 105 | 207 |
| 1 | 130 | 105 | 86 | 44 | 120 | *1.013* | *22.5* | 99 | 198 |
| 2 | 126 | 101 | 85 | 41 | 128 | *1.069* | *22.5* | 100 | 194 |
| 3 | 121 | 99 | 84 | 37 | 139 | *1.078* | *22.5* | 103 | 190 |
| 4 | 113 | 97 | 79 | 34 | 145 | *1.079* | *22.5* | 112 | 175 |
| 5 | 110 | 96 | 80 | 30 | 157 | *1.078* | *22.5* | 123 | 175 |
| 6 | 111 | 97 | 81 | 30 | 145 | *1.077* | *22.5* | 119 | 179 |
| 7 | 115 | 96 | 84 | 31 | 145 | *1.079* | *22.5* | 119 | 179 |
| 8 | | 98 | 84 | | 133 | *1.078* | *22.0* | 108 | 182 |
| 9 (6 mos.) | | 99 | | | | *1.077* | *20.0* | | |
| Source | (11) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

*Electric only.

Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of four manufacturers whose output represented 65-70% of units made in Canada in 1968. The data for years prior to 1964 were taken from three companies and prior to 1961 from two. The average does not seem to have been unduly biased by these changes.

CHART 15

CLOTHES DRYERS – GAS AND ELECTRIC

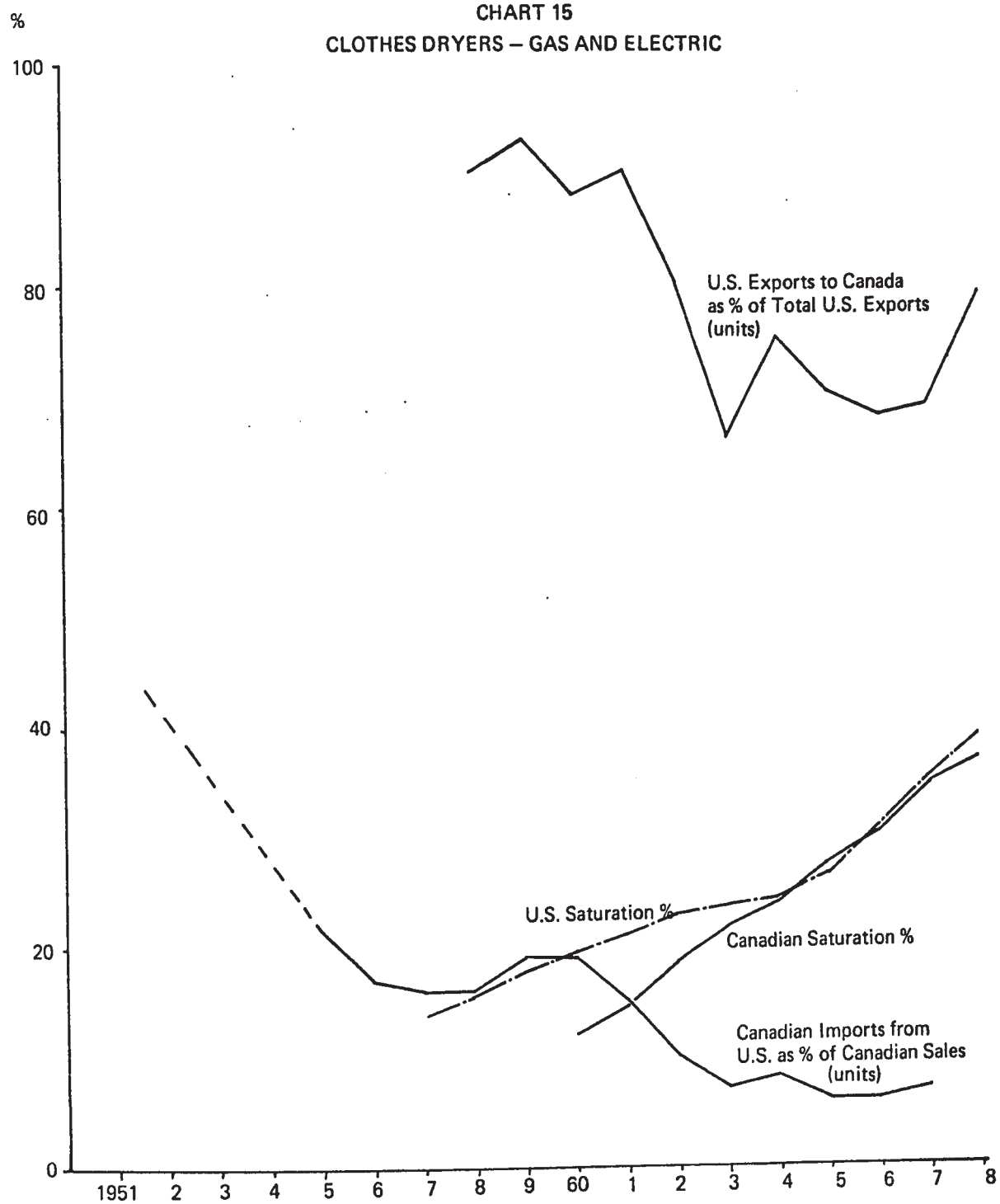
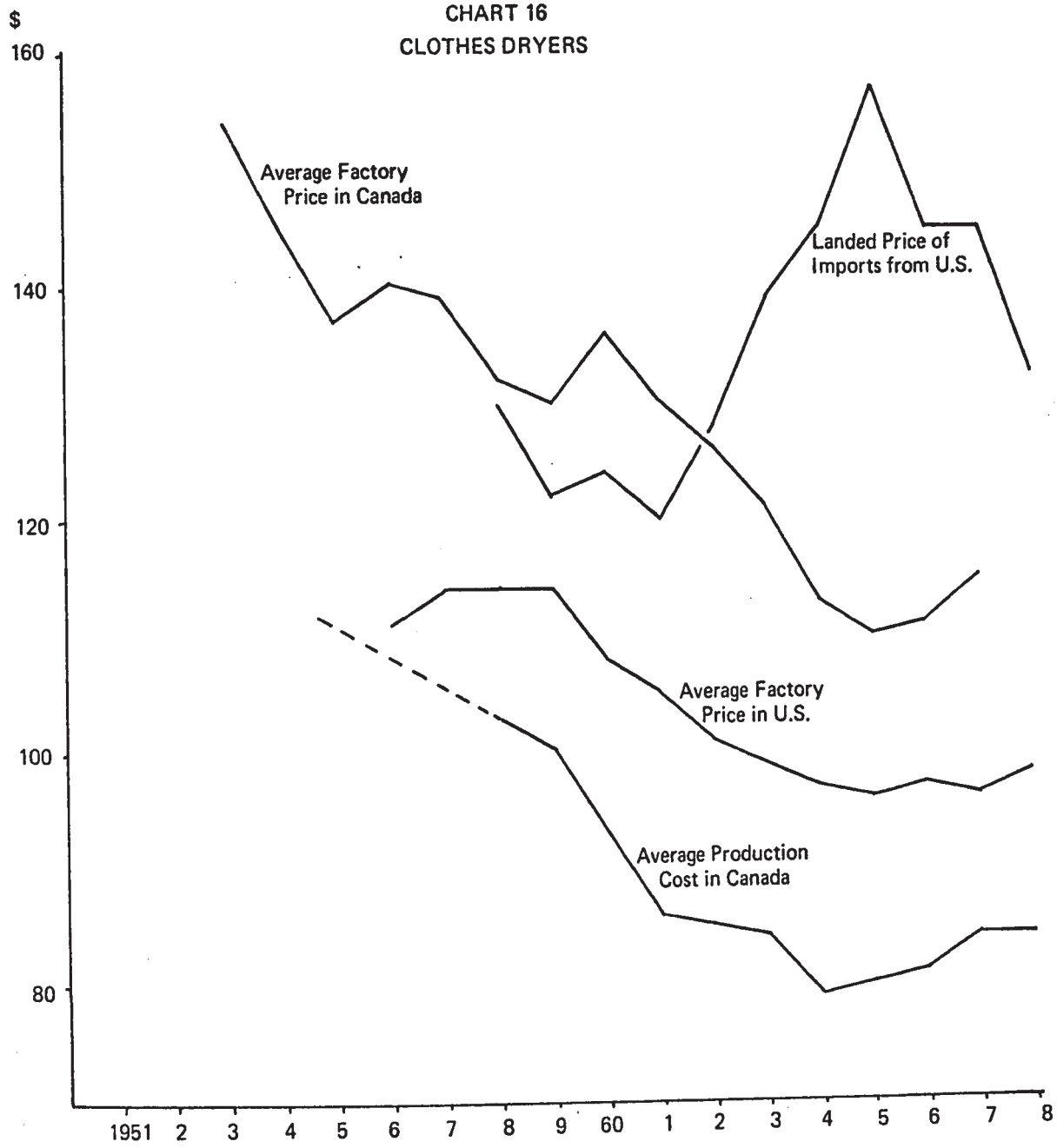


CHART 16
CLOTHES DRYERS



## CHAPTER XI

## REFRIGERATORS

The refrigerator is another product that has been made in Canada since 1930. Imports from the United States were as high as 66% of the total sold in 1930 and 1931, but declined to around 20% in the late thirties. World War II caused a virtual cessation of production activity, and normal trading patterns did not emerge until 1946 when some 57,000 refrigerators were made in Canada and 11,000 imported from the United States. In 1947, Canadians produced over 96,000 units and imported over 41,000 from the U.S. - an import ratio of 30% of Canadian industry sales. The period from 1948 to 1951 brought a dramatic increase in Canadian sales of refrigerators (from 140,000 to 360,000), and the virtual elimination of all imports due to the trade embargo.

The predicted pattern of heavy imports began to re-emerge in 1951, and by 1952 imports from the U.S. had reached 177,000 units, a huge 42% of total Canadian sales for the year. Over the next ten years there was a gradual

and steady displacement of imports by domestic production, until by 1963 imports from the U.S. were a mere 2% of Canadian sales (see Chart 17). They continued at a nominal rate through 1968, and the Canadian percentage of total U.S. exports of refrigerators followed a similar pattern. However, the late 1960's brought about the displacement of the United States as Canada's main source of refrigerator imports, as the following DBS statistics show. It will be noted that the figures shown as imports from the U.S. do not match the corresponding figures on Table 13. The reason is that figures in Table 13 were taken from U.S. export data, which often differ markedly from Canadian import data. It is an unfortunate state of affairs that such wide variations should exist in what the U.S. claims to have exported to Canada and what Canada claims to have imported from the U.S. Comments from Canadian government officials on these discrepancies could not be obtained.

Total imports of refrigerators did not exceed 9% of total units sold in Canada for any of the above years. These data were very revealing about the type of import competition Canadians faced. On the one hand U.S. companies were exporting the larger size, top-of-the-line models at prices well above average Canadian factory prices, while on the other hand, Italian, Japanese and British companies were exporting small capacity, low-priced units. Thus again we see U.S. exporters competing in Canada on the basis

CANADIAN IMPORTS OF REFRIGERATORS
FROM SELECTED COUNTRIES

| | Country of Origin | Units | $000's | Unit Value |
|---|---|---|---|---|
| 1963 | U.S.A. | 11,847 | 3,453 | $291 |
| | U.K. | 3,911 | 228 | 58 |
| | Italy | 539 | 34 | 63 |
| 1964 | U.S.A. | 6,781 | 1,376 | 203 |
| | U.K. | 4,470 | 257 | 57 |
| | Italy | 2,097 | 143 | 68 |
| 1965 | U.S.A. | 6,518 | 1,329 | 204 |
| | U.K. | 4,293 | 246 | 57 |
| | Italy | 2,580 | 147 | 57 |
| | Japan | 3,450 | 109 | 32 |
| 1966 | U.S.A. | 12,308 | 2,511 | 204 |
| | U.K. | 2,748 | 178 | 65 |
| | Italy | 3,966 | 205 | 52 |
| | Japan | 6,690 | 278 | 42 |
| 1967 | U.S.A. | 7,977 | 1,425 | 179 |
| | U.K. | 4,327 | 284 | 66 |
| | Italy | 16,326 | 931 | 57 |
| | Japan | 2,979 | 110 | 37 |
| 1968 | U.S.A. | 7,940 | 1,377 | 173 |
| | U.K. | 2,325 | 129 | 55 |
| | Italy | 20,903 | 1,174 | 56 |
| | Japan | 2,658 | 136 | 51 |

Source: DBS 65-007

of product features and style with no attempt to underprice Canadian producers. Imports from the U.K., Italy and Japan, on the other hand, might again be classed as "low-wage" trade in that they underpriced the Canadian market, but even here the underlying rationale for the trade was not merely a factor cost advantage. It arose out of a recognition (mainly by Canadian producers) that the small size

units manufactured in high volume for the domestic markets of Italy, Japan and the U.K. did appeal to a segment of the Canadian market.

Canadian companies had been generally unsuccessful in their attempts to export refrigerators back to the U.S. As followers of U.S. styles and designs, and as higher cost producers due to smaller scale, Canadians have had neither a product advantage nor a cost advantage. Hence it had become futile for Canadian firms to try to export to the U.S., and very difficult for them to compete with the U.S. in other national markets. D.B.S. statistics on exports unfortunately grouped refrigerators with freezers and occasionally included parts in the value column, making it difficult to derive any meaningful analysis.

However, since by 1968 both the freezer and the refrigerator were in their late maturity, and manufacture of freezers was substantially in the hands of Canadian owned producers, Canada ought to have been moving towards a net export position. It was therefore considered important to try to separate freezers from refrigerators to examine the status of each product and the average prices at which they were being exported. The following division was based on data supplied by the Canadian Appliance Manufacturers' Association (CAMA).

## NET TRADE POSITION REFRIGERATORS AND FREEZERS

| | Refrigerators Units 000's | | | Freezers Units 000's | | |
|---|---|---|---|---|---|---|
| | Units Exported | Units Imported | Net | Units Exported | Units Imported | Net |
| 1961 | 11.6 | 56.6 | (45.0) | 0.2 | 16.7 | (16.5) |
| 1962 | 8.0 | 36.7 | (28.7) | 0.6 | 11.8 | (11.2) |
| 1963 | 8.4 | 16.4 | ( 8.0) | 15.4 | 2.8 | 12.6 |
| 1964 | 8.3 | 13.6 | ( 5.3) | 23.0 | 4.3 | 18.7 |
| 1965 | 7.4 | 17.1 | ( 9.7) | 26.4 | 4.0 | 22.4 |
| 1966 | 26.1 | 25.8 | 0.3 | 10.5 | 3.6 | 6.9 |
| 1967 | 8.1 | 31.8 | (23.7) | 5.6 | 6.5 | ( 0.9) |

Source: DBS 65-007 and CAMA.

| | Dollars (000's) | | | Dollars (000's) | | |
|---|---|---|---|---|---|---|
| | Dollars Exported | Dollars Imported | Net | Dollars Exported | Dollars Imported | Net |
| 1961 | 1,922 | 10,506 | (8,584) | 35 | 2,898 | (2,863) |
| 1962 | 1,277 | 7,422 | (6,145) | 89 | 2,065 | (1,976) |
| 1963 | 3,225 | 3,725 | ( 500) | 2,235 | 527 | 1,708 |
| 1964 | 1,221 | 1,782 | ( 561) | 3,368 | 705 | 2,663 |
| 1965 | 1,111 | 1,849 | ( 738) | 3,939 | 692 | 3,247 |
| 1966 | 3,847 | 3,177 | 670 | 1,549 | 554 | 995 |
| 1967 | 1,395 | 2,759 | (1,364) | 966 | 756 | 210 |

Source: DBS 65-007 and CAMA.

## PRICE STATISTICS ON TRADE FLOWS IN REFRIGERATORS AND FREEZERS

| | Refrigerators | | | | Freezers | | | |
|---|---|---|---|---|---|---|---|---|
| | Average Export Price | Average Import Price | Average Production Cost | Average Factory Price | Average Export Price | Average Import Price | Average Production Cost | Average Factory Price |
| 1961 | 172* | 186 | 124 | 170 | 175 | 174 | 141 | 174 |
| 1962 | 160* | 202 | 130 | 167 | 148 | 175 | 137 | 161 |
| 1963 | 384* | 228 | 130 | 171 | 145 | 188 | 134 | 162 |
| 1964 | 146 | 131 | 130 | 168 | 147 | 164 | 128 | 148 |
| 1965 | 150 | 108 | 125 | 163 | 149 | 173 | 116 | 139 |
| 1966 | 147 | 123 | 126 | 163 | 148 | 154 | 116 | 139 |
| 1967 | 172 | 87 | 133 | 184 | 173 | 116 | 116 | 138 |

Source: DBS 65-007 and Tables 6 and 14.

* Apparently includes the value of exported parts.

From the foregoing data, and that supplied earlier on imports from other countries, it is apparent that Canada has not become a net exporter of refrigerators - with the exception of the single year 1966. It is also clear that Canada's refrigerator exports were generally at prices below the average Canadian factory price - reflecting either low end models or marginal pricing of exports. Exports to the United States, incidentally, were priced between 10-15% below the average export prices (based on refrigerators and freezers combined).

There was clearly a very significant surge in freezer exports during the years 1963-66 and at prices which appeared reasonably attractive from 1965 on. Canada in fact became a net exporter of freezers during this time. However, when examined at the micro level of the firm, this export surge had a rather simple explanation. A large percentage of the freezers exported are known to have been shipped by Kelvinator to its U.S. parent. This trade was halted when Kelvinator was taken over by the White group. One industry executive made the comment that these exports were mostly in larger sizes which were priced very close to cost. He also mentioned that freezer exports to other countries were generally more profitable than sales in the highly price-competitive domestic market, but that export markets were gradually closing. Evidently the South American and Caribbean countries had begun to protect their fledgling domestic in-

dustries, and Europe was closing fast due to aggressive Italian competition. The Middle East was opening a little due to the negative force of anti-U.S. sentiment. And the U.S. market remained a problem unless one had a "captive" customer (i.e., the parent company marketing strength). Otherwise it was necessary either to underprice U.S. manufacturers on their home ground, or to develop significant product differentiation by which to command a price premium.

It is interesting also to observe the behavior of import prices in relation to Canadian factory prices. For the years 1961 to 1963 the import price was consistently the higher. These were the years of exclusive U.S. dominance of Canada's imports. Other countries became important suppliers of refrigerators in 1964 and of freezers in 1966-67, and pulled down the average import price level. As far as imports from the United States were concerned, they had been largely at prices above average Canadian factory prices, and the import values given were before duty. It would appear from these data that Canada has been importing either technology or marketing skills from the U.S., and low wage output from other nations.

We would expect with a mature product like the refrigerator to observe substantial declines in price and cost behavior since the market peaked in the early 1950's. Table 14 indicates a drop in average factory price from $196 in 1951 to $163 in 1966 - a decline of about 17% - but

in 1967 it rose again to $184. Production costs showed no consistent tendency to decline; the average was the same in 1968 as in 1958. On the other hand, the DBS wholesale price index on refrigerators showed a steady decline from a base of 100 in 1956 to 70.5 in 1967. Average factory price over this same period had actually risen from $176 to $184 due mainly to a large upward move in 1967. The difference between the DBS index and the average factory price trend was due to significant changes in product mix. The addition of new features and colors and the steady growth in average size had all exerted upward pressure on average factory prices, while greater production efficiency and changes in distribution patterns had exerted downward pressure. One company, for example, whose average price had risen during the period in question, commented that,

> Prior to 1965 we could expect an annual increase of about 1.5% in materials prices and 3-4% in the cost of labor. Since 1965, these annual increases have been in the order of 2-3% and 6-7% respectively. However, we have normally been able to contain these factor price increases by improvments in product design and production processes. The reason for our average price increases is due almost entirely to changes in product mix - sizes and features - required to complement our general strategy of emphasizing product quality and top-of-the-line models.

In an attempt to measure the magnitude of such factors as changes in size, addition of new features, and changes in distribution patterns, the following data was

obtained from the companies involved.

CANADIAN SALES OF REFRIGERATORS
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Dealers | 44.5% | 42.7% | 42.6% |
| Dept. and Chain Stores | 35.6 | 36.0 | 38.0 |
| Builders | 19.9 | 21.3 | 19.4 |
| | 100.0% | 100.0% | 100.0% |

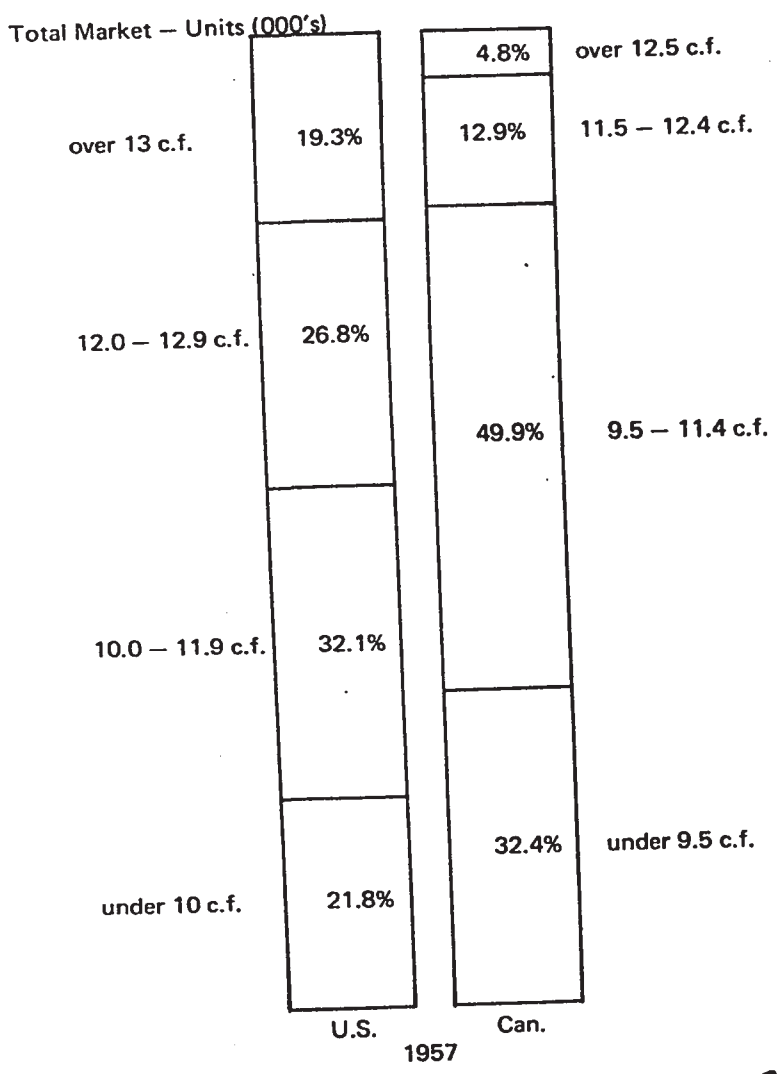
Again we see a trend towards department and chain stores at the expense of dealers, and this would exert some small downward pressure on average factory price.

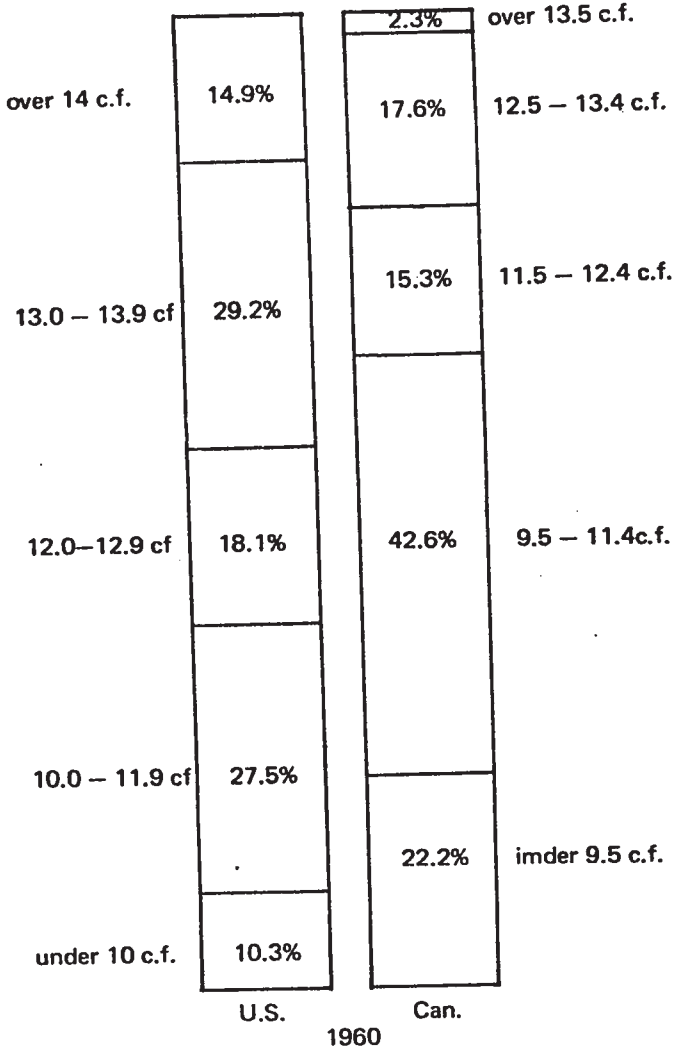
AVERAGE SIZE OF ALL REFRIGERATORS
SOLD (IN CUBIC FEET)
CANADA VERSUS U.S.

| | 1956 | 1960 | 1964 | 1967 |
|---|---|---|---|---|
| Canada | 9.8 | 10.8 | 12.0 | 12.6 |
| U.S. | 10.1 | 12.2 | 13.2 | 14.7 |

This steady growth in average size had clearly forced costs and prices upwards over time. The discrepency in sizes between the Canadian and U.S. markets also lent support to the opinion of many industry executives that imports from the U.S. had been mainly in larger sized units for which the Canadian market was too small to justify production. The data on the following pages amplify the size discrepency further.

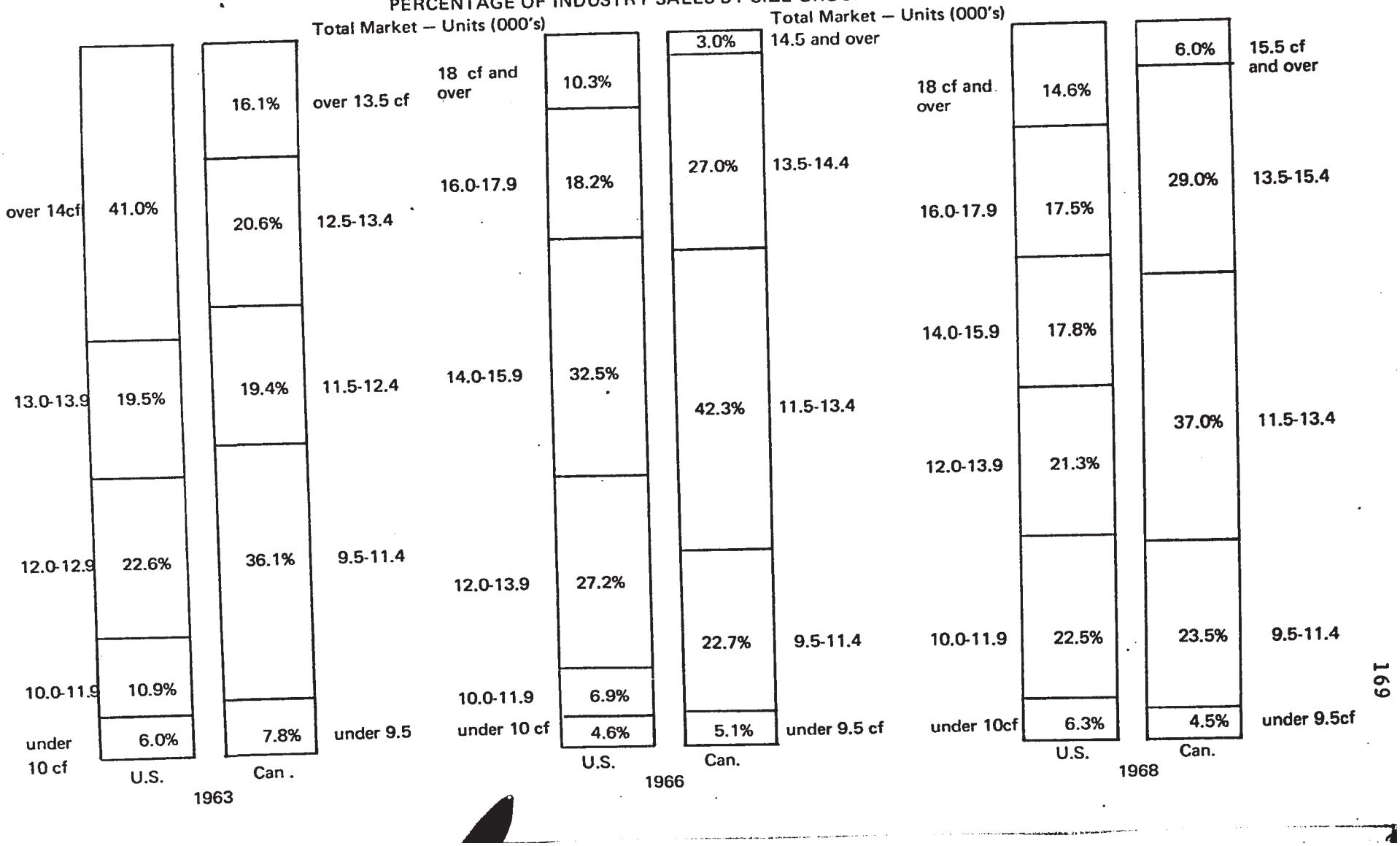
## REFRIGERATORS
## PERCENTAGE OF INDUSTRY SALES BY SIZE GROUP



REFRIGERATORS (Continued)

PERCENTAGE OF INDUSTRY SALES BY SIZE GROUP



Clearly U.S. producers have taken the lead continually during the past decade in the move to high capacity units. Canadian producers tended to delay the investment required to move up in capacity until the size of the market for the larger units had been partly proven by imports. This was a process which U.S. subsidiaries in Canada found particularly convenient. It was also practised by some Canadian department stores. It was believed in fact that the import displacement cycle had recurred again and again with each substantial move up in capacity. After 1959, when imports from the U.S. dropped sharply, the average landed price moved up to levels significantly higher than the Canadian factory price. These high prices seemed to be caused by the restriction of imports exclusively to top-of-the-line large-size models, including side-by-sides in the later 1960's.

The persistent increase in refrigerator capacity did not constitute the only upward pressure on average factory prices. At least three other important and costly features had gained increasing acceptance with consumers, and had had corresponding cost and price effects. These included the move to two-door refrigerators, the growth of "no frost" units and the trend to color.

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TWO-DOOR UNITS AS A PERCENTAGE OF TOTAL SALES OF REFRIGERATORS

| | 1960 | 1963 | 1966 | 1968 |
|---|---|---|---|---|
| U.S. | 48.7% | 62.5% | 75.2% | 79.5% |
| Canada | --- | 36.0% | --- | 62.0% |

"NO FROST" UNITS AS A PERCENTAGE OF TOTAL SALES OF REFRIGERATORS

| | 1963 | 1964 | 1966 | 1968 |
|---|---|---|---|---|
| U.S. | --- | 36.2% | 56.9% | 62.9% |
| Canada | 12.0% | --- | --- | 44.0% |

COLOR UNITS AS A PERCENTAGE OF TOTAL CANADIAN SALES OF REFRIGERATORS

| | 1963 | 1968 |
|---|---|---|
| Yellow & Turquoise | 8% | 0% |
| Coppertone | 0 | 13 |
| Avocado | 0 | 13 |
| All Other | 3 | 3 |
| Total | 11% | 29% |

In the light of the foregoing trends and the substantial increases in raw materials costs and wage rates, the average factory price trend shown in Table 14 was really quite remarkable. Even more remarkable, perhaps, was the extent to which production costs had held the line. Average gross margins had moved erratically without discernible trend (see Table 14), but industry executives indicated

that margins were better on top-of-the-line models (larger sizes with all features), and that the more popular models were in a severe margin squeeze. It appeared that the average gross margin represented the net effect of these two countervailing forces, and that upward pressure was largely sustained by new product development and the extent to which manufacturers did their own marketing. It is clear from the foregoing tables that the diffusion of each feature innovation on refrigerators began earlier and diffused more rapidly in the United States.

This leadership in product development - including the move up in refrigerator capacity - was the basis for most U.S. exports of refrigerators to Canada. Their concentration was on the newer, more expensive and more profitable models during the early period when their price elasticity was low. Again this generally led to prices which passed the tariff on to the Canadian consumer.

Attempts to measure trade flows in refrigerator components over time were fraught with problems. DBS statistics for the late 1960's showed Canadian imports of refrigeration compressors and condensers separately, but other refrigeration parts were grouped into a category "air conditioning and refrigeration equipment and parts (not elsewhere specified)". Industry sources, on the other hand, indicated that no compressors or condensers were imported from the U.S. for use in domestic refrigerators or freezers.

A U.S. subsidiary manufactured them in Canada, importing many sub-components in the process. Import competition had, however, developed from European firms. It appears that the 250,000 condensers and 160,000 compressors imported from the U.S. in 1967 were for purposes other than domestic appliances. The cost of compressors and condensers for domestic appliances were in the region of $15-20 and $6-7 respectively, as compared to the respective values of imports from the U.S. of $48 and $36. Imports of compressors from Europe in 1967 were as follows:

CANADIAN IMPORTS OF
EUROPEAN COMPRESSORS

| | Units | Value $000's | Unit Value |
|---|---|---|---|
| U.K. | 60,531 | 1,135 | $18.75 |
| Italy | 102,437 | 1,657 | 16.20 |
| Denmark | 49,859 | 851 | 17.10 |
| West Germany | 26,975 | 387 | 14.40 |

Source: DBS 65-007

It appears that refrigerators were one product where alternative sources of components had been sought. According to U.S. export data, however, there were still substantial trade flows in other refrigerator components. The figures shown as refrigerator components imports on Table 13 were taken from U.S. export statistics on "refrigerator and freezer parts". Industry sources in Canada indicated that freezer parts imports, other than European hermetically

sealed compressors, were negligible. Since most Canadian freezers were made by Canadian-owned firms, there was probably less access to preferentially priced U.S. components. It is therefore felt that the figures in Table 13 constituted the most accurate available representation of refrigerator components imports from the U.S. into Canada, and these figures indicated a decline from $46 per unit in 1954 to $16 in 1967 (rising to $21 in 1968). Components imports were believed to have been higher per unit on the newer, larger capacity refrigerators and lower on the mature smaller units. Thus the fluctuations in aggregate component parts imports evident from Table 13 may have been caused by trends in consumer demand for larger capacity units.

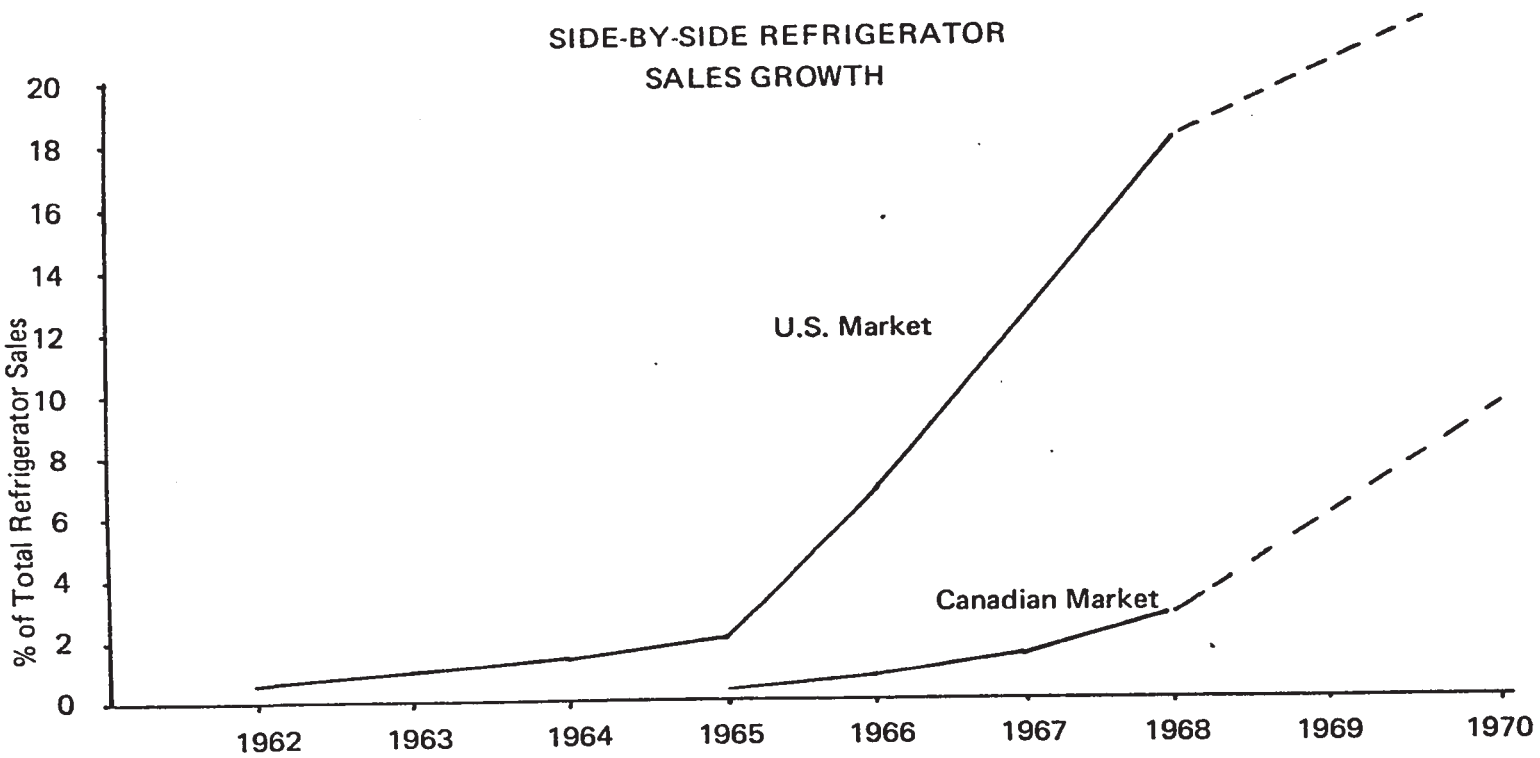
Side-by-Sides

The refrigerator per se was clearly in its late maturity phase with demand largely influenced by the replacement cycle. However, the late maturity phase sometimes triggers innovation in the form of significant product modifications, as long as manufacturers are not caught up in a heavy incidence of low margin private and stencil brand work (e.g., freezers and wringer washers). These product modifications, which tend to arise more when manufacturers do their own marketing, usually have the effect of accelerating replacement demand. In a minor way, such developments as two-door units, no-frost and larger capacities

constituted a degree of innovation in refrigerators and doubtless affected the timing of demand; but one relatively recent development constituted a major departure from conventional refrigerator technology. The side-by-side refrigerator-freezer with aggregate capacity between 18-22 cu. ft. was developed in the United States as early as 1962. For the next three years its sales remained below 2% of the total U.S. market, but 1965 saw the beginning of its take-off in the United States, and by 1968, 18% of all refrigerators sold were side-by-sides.

By comparison the Canadian market for side-by-sides in 1968 was still less than 3% of total refrigerator sales, and all of these units were supplied either by imports from the U.S. or by assembly in Canada of components imported from the U.S. As of 1969, no appliance manufacturers had invested the roughly one million dollars required to become manufacturers of side-by-sides in Canada, although the industry association was forecasting that they would constitute 35% of total Canadian refrigerator sales by 1973.

The technological breakthrough that made large capacity side-by-sides feasible - given the constraints of kitchen space - was the development of foamed-in-place insulation which allowed much thinner refrigerator walls. Greater internal capacity could be achieved without enlarging external dimensions. Large scale operations with foamed-in-place insulation required a large investment in


SIDE-BY-SIDE REFRIGERATOR
SALES GROWTH
% of Total Refrigerator Sales
20
18
16
14
12
10
8
6
4
2
0
U.S. Market
Canadian Market
1962
1963
1964
1965
1966
1967
1968
1969
1970

new equipment, tooling and plant layout. Once this investment was made, however, it could be used for larger capacity refrigerators as well as for side-by-sides. One company executive in Canada who was in the midst of reaching a decision on whether to invest the required million dollars commented as follows:

> The demand for higher capacity refrigerators in the Canadian market has historically followed U.S. demand with about a four-year lag. This table shows the trend in the U.S. and our conservative projections for the future.

| | % of the Market for 15 cu.ft. and Over | |
|---|---|---|
| Year | U.S. | Canada |
| 1964 | 16 | 2 |
| 1965 | 26 | 2 |
| 1966 | 37 | 3 |
| 1967 | 47 | 8 |
| 1968 | 50 | 11 |
| 1969 | 53 | 15 |
| 1970 | 56 | 19 |
| 1971 | 58 | 24 |
| 1972 | 60 | 27 |

> Importation of these larger sizes from our parent is very costly since we are required to pay their distributor price. Importation of components - i.e. refrigerator cases and liners - would likewise prove too costly.
>
> Our marketing strategy is to give the consumer the maximum cubic capacity inside the refrigerator, with the minimum exterior dimensions. Thus my inclination is to proceed with the necessary investment to go for foamed-in-place insulation in Canada.
>
> My analysis of the situation assumes that the tariff rate on refrigerators and components will remain at 20% for at least four years. I hope I will not be proven

> wrong in this critical assumption. Certainly we require a stable tariff policy to ensure expenditures like this can be made with reasonable confidence.

Canadian refrigerator manufacturers had faced similar decisions before, but seldom of such magnitude. The four-year lag in following U.S. size trends was due in part to the practice of importing U.S. models until the Canadian market was big enough to warrant tooling up for their manufacture. This way the Canadian consumer was faced with disproportionately higher prices on the larger units in their initial stages, which tended to retard their acceptance and reinforce the lag. This seemed to be the case in 1968 with side-by-sides in Canada. If no tariff barrier existed, it would have been a long time before any investment would have been made in foamed-in-place insulation facilities in Canada; larger capacity refrigerators would continue to be imported and would displace domestic production to a greater degree over time. The tariff still stood as an effective inducement to investment in Canada. Any plans for its removal would have to include legislated conditions to retain a stipulated volume of production in Canada; otherwise the dynamics of innovation would eliminate Canadian production over time.

It is perhaps worth mentioning that Canadian producers had not at the time of writing embarked on a major advertising and promotion effort on side-by-sides. This

was done in the U.S. in 1966 and each year since. Most Canadians were probably unaware of the side-by-side, and those who were aware probably felt no automatic disposition to buy. This is a further explanation for the Canadian lag, and it was clear that Canadian producers would not invest in the communication task until they were prepared to produce rather than import the product. It was generally felt in the industry that advertising side-by-sides would not produce an adequate increase in sales at present price levels. At the same time it was commented that getting the price down by investing in Canadian production facilities would not guarantee increased sales either. It would require both an investment in production and an investment in marketing to be made simultaneously under conditions of considerable uncertainty. This is the nature of most "new product" introduction decisions. The two forms of investment are interdependent and each is significantly subject to economies of scale.

It is sometimes argued that most of the uncertainty is removed from the new product introduction situation in Canada by the availability of prior U.S. experience. Many U.S. parents supply their Canadian subsidiaries with the results of their market research and the productivity of their advertising programs. Executives in Canadian subsidiaries freely acknowledged this competitive edge they held over Canadian independents, but pointed to the fact

that, while the uncertainty was lower, the risk in Canada was higher due to smaller Canadian market size and the correspondingly higher investment per unit in production and marketing. However, in the case of side-by-sides, there was an additional element of uncertainty. Acceptance of this product in the U.S. was doubtless facilitated by the fact that most U.S. freezers were uprights made for the kitchen (see section on freezers). Hence freezers in the U.S. had historically stood side by side with refrigerators. In Canada, the freezer was designed for the basement and was not only larger in capacity than U.S. freezers, but also much larger than the freezer section of a side-by-side. It was, therefore, possible that Canadian acceptance of the side-by-side would be slower than U.S. acceptance, quite apart from the take-off lag, but it was difficult to predict how much slower the Canadian acceptance rate would be.

It appeared likely at the time of writing that at least one subsidiary in Canada would soon invest in foamed-in-place insulation and that this action would force others to follow suit. The major independent Canadian producer of refrigerators began importing side-by-sides on a stencil basis in 1968 and had no plans to invest in foamed-in-place insulation. Hence, the history of the product has been roughly as follows:

1964 - 2,421 units imported from U.S. @ $209 per unit (before duty).

1965 - 2,377 units imported from U.S. @ $227 per unit (before duty).

1966 - Two subsidiaries began to assemble in Canada importing ALL components (i.e., knocked down units) from their U.S. parents, and supplied other subsidiaries in Canada.
972 units imported from U.S. @ $254 per unit constituting 32.4% of Canadian sales

1967 - 1,850 units imported from U.S.@ $278 per unit constituting 28% of Canadian sales.

1968 - 1,649 units imported from U.S. @ $308 per unit constituting 15% of Canadian sales.
Includes a few imports by a Canadian independent.

1970 - First subsidiary expected to be manufacturing side-by-sides in Canada.

Sources: DBS 65-007, Company estimates of Canadian market.

The average Canadian factory price of side-by-sides was approximately $420 in 1967 and $415 in 1968, including both imported and Canadian assembled units. This would indicate the Canadian consumer would have to pay close to $600 on the average, after federal sales tax and retail margins were added, and this was more than $200 above the average U.S. retail price. Most of this $200 was accounted for by exporters' profits in the U.S., the Canadian tariff and the federal sales tax. Two subsidiaries who reported

imports from their parent companies in 1967 and 1968 (but not in prior years) indicated average unit costs of $217 and $387 respectively and factory prices of $415 and $510. It is clear that in these early stages the limited market for the product was somewhat insensitive to price, but price would have to come down substantially before larger volume markets could be tapped.

In many ways the process of introducing the side-by-side to the Canadian market was judged by executives to be typical of the new product introduction process.

# TABLE 13
## REFRIGERATORS
### U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | 352.3 | 6,200 | 12.7 | 4 | 199.6 | 6 | | | 11,400 | 33 |
| 1 | 367.0 | 4,075 | 89.0* | 24 | 377.4 | 24 | | | 9,760 | 35 |
| 2 | 421.1 | 3,570 | 176.7 | 42 | 373.6 | 47 | | | 7,670 | 31 |
| 3 | 444.7 | 3,650 | 169.3 | 38 | 363.4 | 47 | | | 10,550 | 38 |
| 4 | 322.5 | 3,600 | 92.5 | 29 | 289.6 | 32 | | | 10,600 | 46 |
| 5 | 364.4 | 4,200 | 92.9 | 25 | 303.6 | 31 | | | 10,350 | 38 |
| 6 | 362.5 | 3,700 | 93.3 | 26 | 318.1 | 29 | | | 11,400 | 42 |
| 7 | 313.8 | 3,350 | 78.3 | 25 | 298.7 | 26 | 81.9 | 97.3 | 6,900 | 29 |
| 8 | 314.0 | 3,117 | 87.6 | 28 | 308.1 | 28 | 85.2 | 97.7 | 4,800 | 21 |
| 9 | 329.9 | 3,785 | 73.1 | 22 | 265.4 | 28 | 88.2 | 98.0 | 7,250 | 28 |
| 1960 | 284.8 | 3,475 | 45.4 | 16 | 234.5 | 19 | 90.3 | 98.2 | 6,150 | 26 |
| 1 | 286.7 | 3,480 | 38.0 | 13 | 206.9 | 18 | 92.0 | 98.3 | 5,850 | 24 |
| 2 | 280.3 | 3,775 | 23.1 | 8 | 186.6 | 12 | 93.3 | 99.0 | 7,450 | 29 |
| 3 | 305.0 | 4,125 | 5.5 | 2 | 217.2 | 3 | 94.2 | 99.1 | 7,500 | 25 |
| 4 | 337.7 | 4,545 | 8.3 | 2 | 162.7 | 5 | 95.0 | 99.3 | 7,650 | 23 |
| 5 | 369.5 | 4,930 | 8.0 | 2 | 148.3 | 5 | 95.8 | 99.5 | 6,100 | 17 |
| 6 | 415.3 | 4,974 | 12.6 | 3 | 173.2 | 7 | 96.5 | 99.6 | 6,850 | 17 |
| 7 | 392.3 | 4,713 | 11.2 | 3 | 154.7 | 7 | 97.2 | 99.7 | 5,950 | 16 |
| 8 | 410.7 | 5,151 | 9.8 | 2 | 124.9 | 8 | 97.4 | 99.8 | 8,300 | 21 |
| 9 (6 mos.) | | | 11.8 | | | | | | 5,150 | |
| Source | (12) | (2) | (3) | | (10) | | (4) | (2) | (3) | |

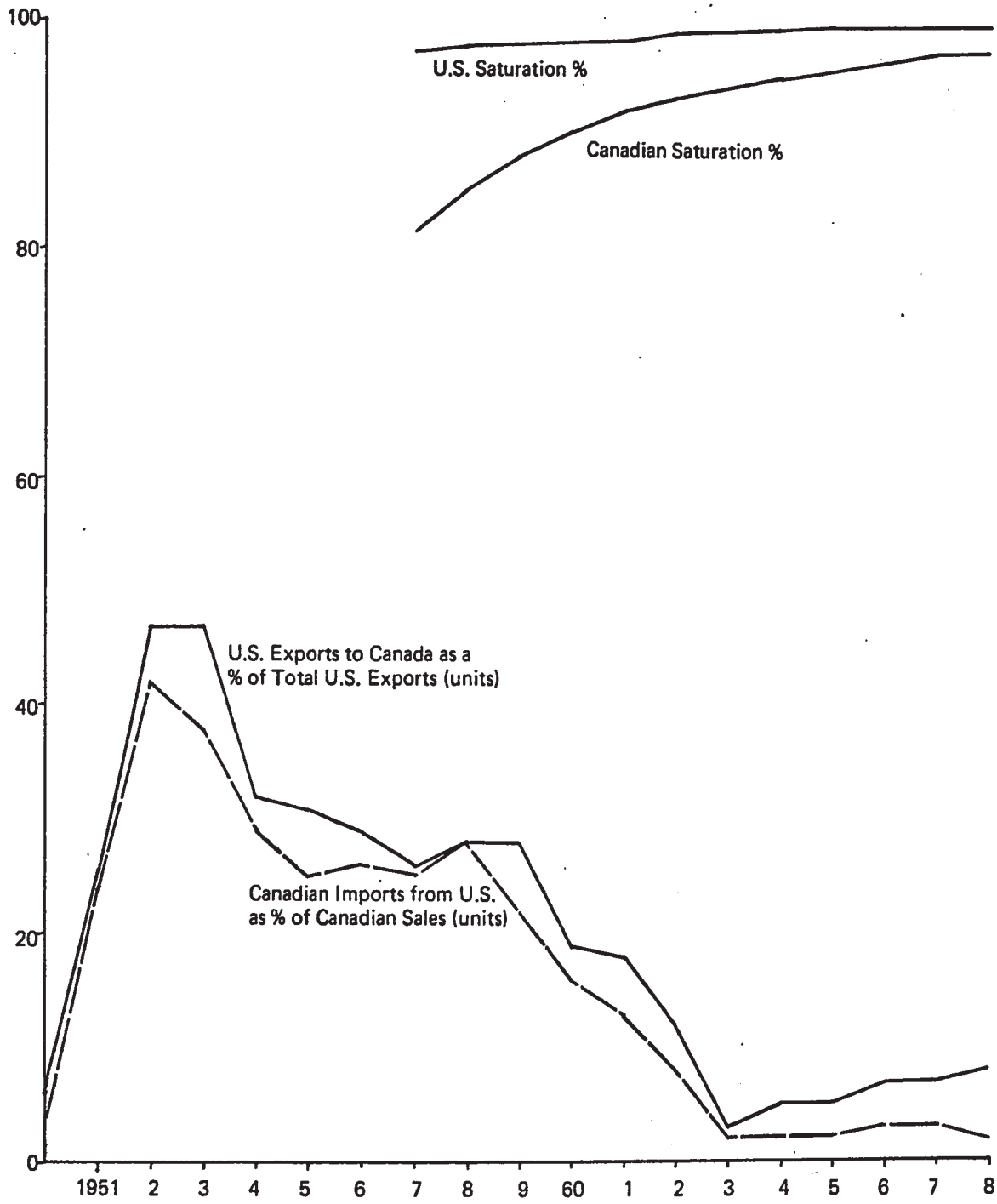
*Includes some freezers.

# TABLE 14
## REFRIGERATORS
### U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 194 | 134E | | | 167 | *1.070* | *20* | 149 | 258 |
| 1 | 196 | 143E | | | 190 | *1.052* | *20* | 161 | 275 |
| 2 | 188 | 148E | | | 182 | *.979* | *20* | 163 | 285 |
| 3 | 185 | 154E | | | 184 | *.983* | *20* | 165 | 295 |
| 4 | 191 | 159 | | | 176 | *.973* | *20* | 166 | 304 |
| 5 | 182 | 168E | | | 180 | *.986* | *20* | 162 | 315 |
| 6 | 176 | 177E | | | 177 | *.984* | *20* | 161 | 325 |
| 7 | 180 | 177E | 132 | 48 | 173 | *.959* | *20* | 162 | 320 |
| 8 | 176 | 177 | 133 | 43 | 162 | *.971* | *20* | 153 | 320 |
| 9 | 173 | 179 | 144 | 29 | 169 | *.959* | *20* | 161 | 336 |
| 1960 | 168 | 180 | 139 | 29 | 173 | *.970* | *20* | 164 | 325 |
| 1 | 170 | 176 | 124 | 46 | 220 | *1.013* | *20* | 172 | 295 |
| 2 | 167 | 168 | 130 | 37 | 218 | *1.069* | *20* | 163 | 287 |
| 3 | 171 | 167 | 130 | 41 | 277 | *1.078* | *20* | 150 | 278 |
| 4 | 168 | 167 | 130 | 38 | 258 | *1.079* | *20* | 171 | 258 |
| 5 | 163 | 171 | 125 | 38 | 305 | *1.078* | *20* | 177 | 260 |
| 6 | 163 | 179 | 126 | 37 | 238 | *1.077* | *20* | 165 | 267 |
| 7 | 184 | 184 | 133 | 51 | 227 | *1.079* | *20* | 162 | 273 |
| 8 | | 188 | 133 | | 296 | *1.078* | *20* | 176 | 280 |
| 9 (6 mos.) | | 193 | | | | *1.077* | *20* | | |
| Source | (11) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of three manufacturers whose output represented 40% of units made in Canada in 1968. From 1961 to 1963 only two companies were averaged, which tended to raise the average price, and data prior to 1961 are for one company only (costs below average).

CHART 17
REFRIGERATORS



## CHART 18
## REFRIGERATORS

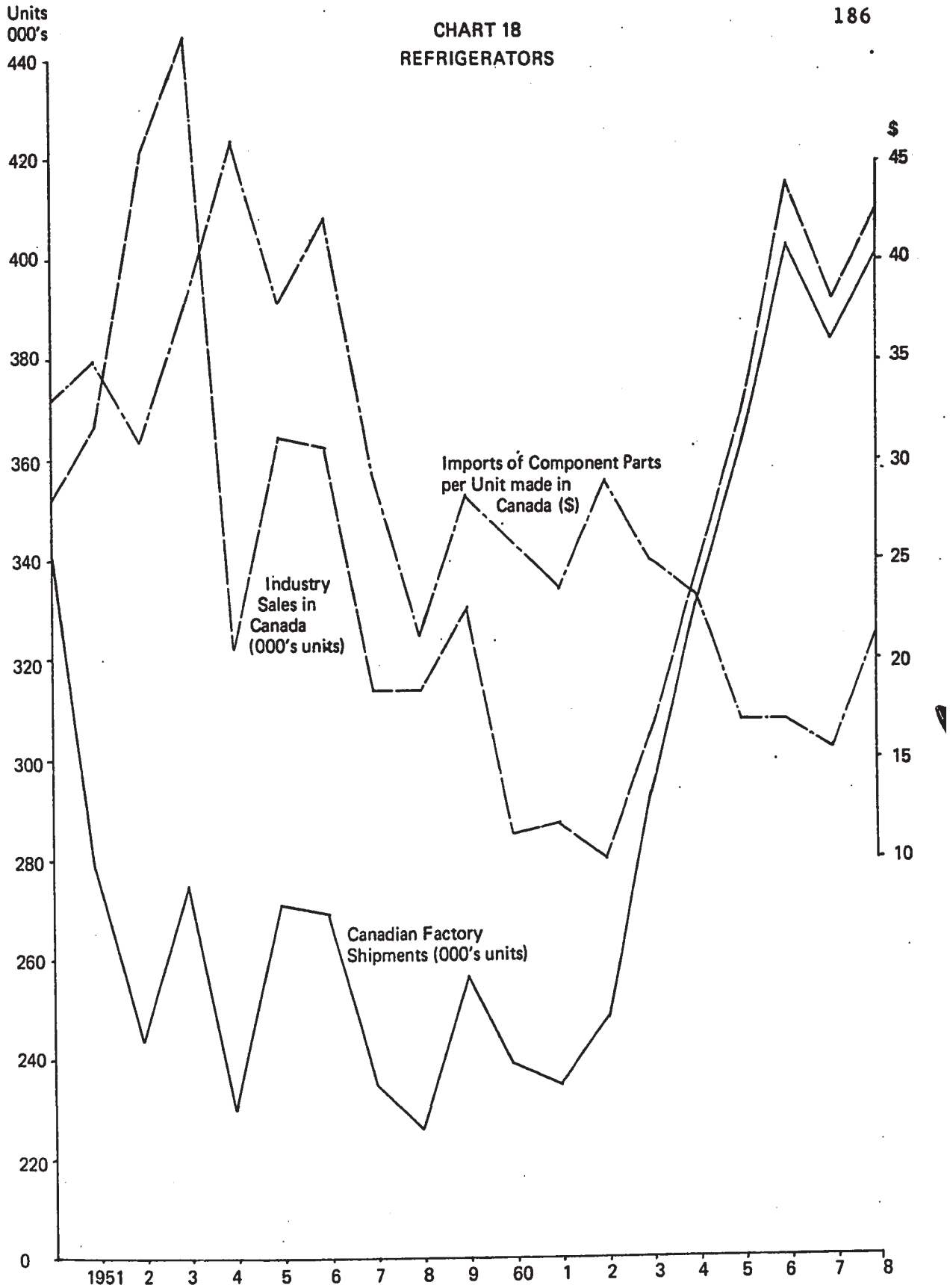
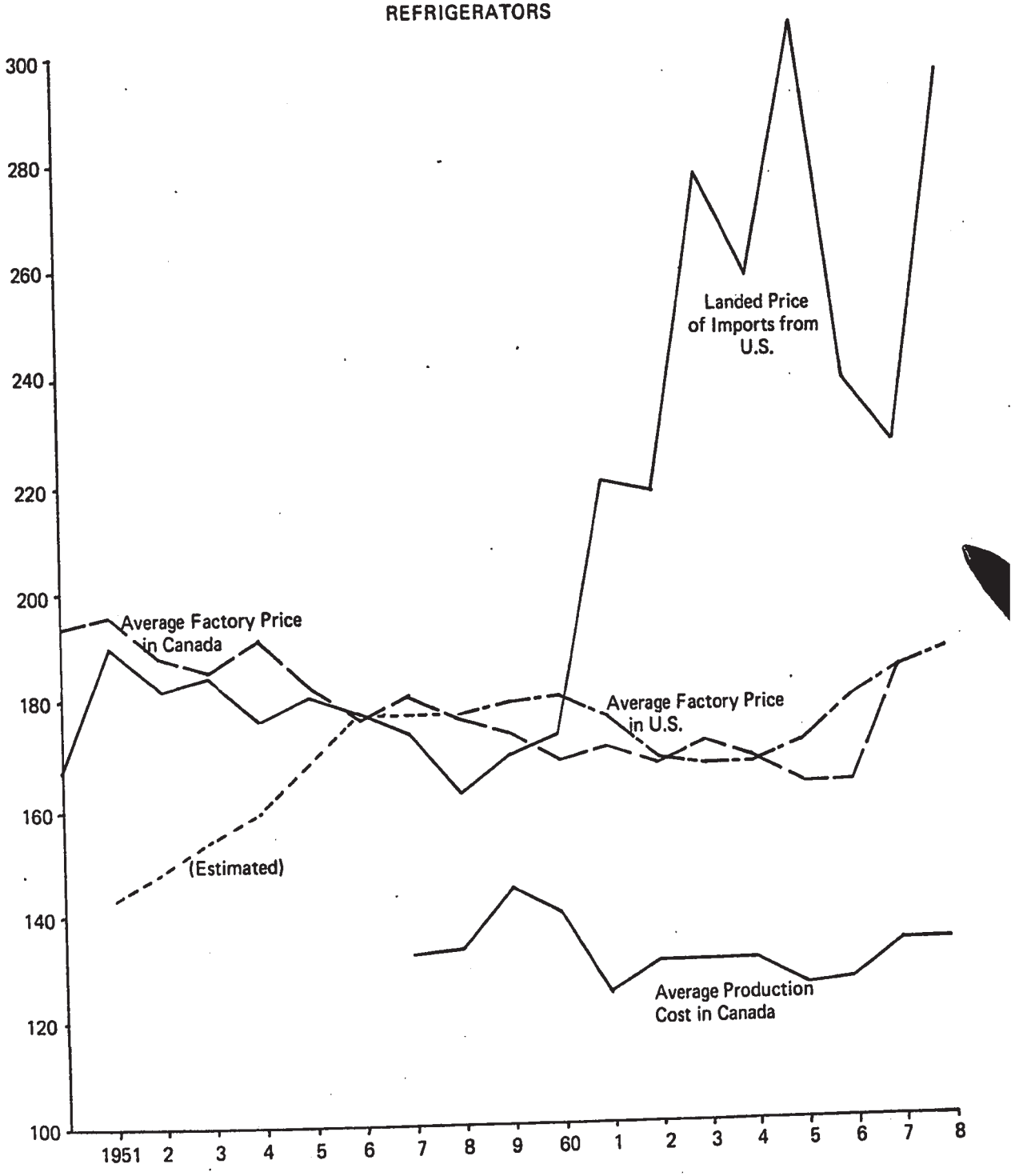


CHART 19
REFRIGERATORS



## CHAPTER XII

## ELECTRIC RANGES

The electric range is another product that was made in volume prior to 1930 by Canadian manufacturers. It has fought a long competitive battle with other types of cooking equipment - coal and wood stoves, and gas ranges - and has gradually emerged as the dominant choice of Canadian consumers. This has not been the case in the United States, where gas and electric ranges have been fighting a much more even battle. In 1968, for the first time in the U.S., sales of electric ranges exceeded sales of gas ranges.

As Table 15 shows, the saturation level for electric ranges in Canada had reached 75.3% by 1968, considerably higher than the U.S. level of 49.9%. Approximately 46% of Canadian output was in the hands of Canadian-owned producers. Both imports and exports had been at relatively low levels since 1958. Canadian exports never rose above minimal levels, whereas imports did reach 10% of Canadian sales in 1956. As Chart 20 depicts, these imports had virtually disappeared by 1961.

Trade flows in electric ranges had in fact been hindered by a very effective non-tariff barrier in the form of "safety" standards. Ranges made in Canada did not meet U.S. standards while ranges made in the U.S. did not meet Canadian standards, and the Canadian standards were regarded as the more stringent. It was clear that both sets of standards had proved effective in promoting safety, and that the differences did not prevail solely to protect consumers. The differences were related to the fusing of electrical systems, and were significant enough to discourage U.S. range manufacturers from tooling up for the Canadian market.

Canadian producers did, however, import some component parts from the United States and, as Chart 21 depicts, these had declined gradually in terms of dollars per unit made in Canada. This trend lends support to the idea of gradual displacement of component imports over time.

It is interesting to note from Chart 22 that, since 1958, the average factory price in Canada has been below that in the U.S. without considering the exchange differential. This might suggest at first glance that the U.S. would not have been able to export to Canada even in the absence of the standards barrier. However, as has been pointed out in connection with other products, U.S. producers seldom tried to export on the basis of price. Furthermore, the higher U.S. factory price did not neces-

sarily reflect lower production efficiency. It was more likely to reflect a different product mix or different channels of distribution.

For example, it was estimated that 23% of all electric ranges sold in the U.S. in 1968 had self-cleaning ovens - a feature innovation that added between $70-$100 to the average factory price of a range. Furthermore, double-oven ranges had grown in popularity from 2.7% of the market in 1963 to 12% in 1968, and these sold at twice the retail price of regular, free-standing ranges. There were, in addition, three models of the new micro-wave ovens available in U.S. retail outlets, and their popularity was reported to be growing. By comparison, self-cleaning ovens accounted for only 4% of the Canadian market in 1968, double-oven ranges about 1.5%, and micro-wave ovens were barely available. There was clearly a very different product mix in the U.S. with new features enjoying a more rapid adoption by consumers. It would perhaps be more reasonable to assume that, had the standards barrier not existed, U.S. producers would have been exporting these more innovative models into Canada.

In terms of distribution channels, there had been a slight shift away from builder sales in both Canada and the U.S. The gains had gone largely to department stores with dealer sales holding steady. It was not possible to obtain U.S. distribution data for comparison, but the fol-

lowing data were obtained for the Canadian market.

CANADIAN SALES OF ELECTRIC RANGES
BY CHANNEL OF DISTRIBUTION

| | 1964 | 1966 | 1968 |
|---|---|---|---|
| Builder | 25.4% | 26.4% | 21.0% |
| Dept. and Chain Stores | 31.6 | 31.6 | 36.0 |
| Dealers | 43.0 | 42.0 | 43.0 |
| Total | 100.0% | 100.0% | 100.0% |

Of the free-standing electric ranges sold in Canada in 1968, 29% were colored, as compared to 23% in 1967.

Again we find that the average U.S. export price is higher than the average U.S. factory price - except for the most recent years (see Table 16). Since U.S. exports to Canada had been blocked, it was felt that very few of the new developments (self-cleaning ranges and micro-wave ovens) had found their way outside the U.S. market. Hence the U.S. factory price exceeded their export price from 1965 to 1968.

There have been wide fluctuations in the landed cost of Canadian imports from the U.S. (see Table 16), particularly since 1959 when imports dropped to negligible levels. The reason for these fluctuations was not determined. Prior to 1959 the landed cost of imports had remained close to the average Canadian factory price.

The Self-Cleaning Range

The self-cleaning range was the result of an intensive, concentrated research program by General Electric in the U.S. The product was introduced to the U.S. market in 1960, and to the Canadian market in 1965 by Canadian General Electric. No imports were recorded prior to 1965 because the U.S. models were fused to meet the standards for their own market and were not admissible in Canada. By the time C.G.E. decided to manufacture self-cleaning ranges in Canada, the product had already achieved modest consumer acceptance in the U.S. This was an important waiting period, because the nature of the innovation could have resulted in powerful consumer resistance.

The principle developed by G.E. involved the high temperature burning of all oven residues. This process, known as the pyrolytic process, required an oven temperature of over 800 degrees, which it was thought might scare potential buyers. General Electric, however, launched an effective marketing program with a well-insulated "safe" product, and succeeded in gaining the required acceptance. Forecasts for 1973 estimated that 55% of all electric ranges sold in the U.S. would be self-cleaning types, and for Canada the figure was estimated at 35%.

As a result of being able to observe the parent company's success over several years, C.G.E. moved directly into full-scale manufacturing. This required an invest-

ment in the region of $200,000, which was expected to be recovered from the higher margins this product could command. Production costs for the self-cleaning range were below 50% of factory prices as compared to approximately 75% for other ranges; at the same time, marketing costs were higher for the self-cleaning range.

In 1965, approximately 1,700 self-cleaning ranges were sold in Canada. The figure reached 3,400 in 1966 and 5,200 in 1967, virtually all sold by C.G.E. from their own production. Other U.S. subsidiaries moved into competition in 1968, pushing total sales to 10,000 units. By 1969 no Canadian-owned companies were manufacturing a pyrolytic self-cleaning range, although some were reported ready to introduce a new catalytic version. This latter version could be used in either gas or electric ranges since it did not require the same high temperatures as the pyrolytic type. What it did require was a special chemical treatment inside the oven which caused it to clean-as-it-cooked. There have been problems in the past with the degree of abrasion resistance of such chemical finishes, but the success of the pyrolytic process caused gas range manufacturers in the U.S. to press for an acceleration of the relevant research.

# TABLE 15
## ELECTRIC RANGES
### U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | 160 | 1,830 | .8 | 0 | 5.8 | 14 | | | 2,440 | 15 |
| 1 | 137 | 1,400 | 3.9 | 3 | 13.6 | 29 | | | 2,180 | 16 |
| 2 | 149 | 1,060 | 6.7 | 4 | 15.4 | 44 | | | 1,570 | 11 |
| 3 | 187 | 1,250 | 13.3 | 7 | 22.0 | 60 | | | 3,050 | 18 |
| 4 | 183 | 1,350 | 15.4 | 8 | 24.5 | 63 | | | 2,940 | 17 |
| 5 | 222 | 1,600 | 23.1 | 10 | 33.9 | 68 | | | 3,720 | 19 |
| 6 | 231 | 1,585 | 13.9 | 6 | 26.5 | 52 | | | 4,743 | 22 |
| 7 | 200 | 1,365 | 6.7 | 3 | 19.3 | 35 | 48.6 | 31.5 | 3,560 | 18 |
| 8 | 230 | 1,354 | 4.2 | 2 | 20.4 | 21 | 49.9 | 33.8 | 3,750 | 17 |
| 9 | 250 | 1,687 | 3.9 | 2 | 13.1 | 30 | 52.8 | 35.6 | 4,380 | 18 |
| 1960 | 224 | 1,495 | 2.1 | 1 | 10.0 | 21 | 56.2 | 37.3 | 3,650 | 16 |
| 1 | 239 | 1,530 | .8 | 0 | 9.1 | 9 | 58.4 | 38.5 | 3,240 | 14 |
| 2 | 240 | 1,675 | .8 | 0 | 8.5 | 10 | 61.5 | 39.0 | 3,260 | 14 |
| 3 | 248 | 1,870 | .4 | 0 | 10.1 | 4 | 64.0 | 40.1 | 2,980 | 12 |
| 4 | 262 | 1,965 | .2 | 0 | 13.5 | 1 | 66.7 | 41.4 | 3,730 | 14 |
| 5 | 296 | 2,065 | .7 | 0 | 13.6 | 5 | 69.0 | 42.4 | | |
| 6 | 323 | 2,029 | 1.2 | 0 | 15.3 | 8 | 70.7 | 44.6 | 3,000 | 9 |
| 7 | 317 | 1,910 | .4 | 0 | 14.6 | 3 | 73.0 | 47.0 | 2,880 | 9 |
| 8 | | 2,307 | .4 | 0 | 17.6 | 2 | 75.3 | 49.9 | 3,250 | |
| 9 (6 mos.) | | | | | | | | | 2,170 | |
| Source | (12) | (2) | (3) | | (3) | | (4) | (2) | (3) | |

# TABLE 16
## ELECTRIC RANGES
### U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 146 | 116E | | | 195 | *1.070* | *22.5* | 132 | 232 |
| 1 | 160 | 125E | | | 183 | *1.052* | *22.5* | 141 | 250 |
| 2 | 154 | 127E | | | 161 | *.979* | *22.5* | 140 | 255 |
| 3 | 162 | 127E | | | 160 | *.983* | *22.5* | 137 | 255 |
| 4 | 151 | 131E | | | 147 | *.973* | *22.5* | 130 | 262 |
| 5 | 155 | 135E | | | 140 | *.986* | *22.5* | 122 | 265 |
| 6 | 153 | 140E | 98 | 55 | 131 | *.984* | *22.5* | 113 | 260 |
| 7 | 156 | 145E | 105 | 51 | 157 | *.959* | *22.5* | 141 | 265 |
| 8 | 149 | 150 | 101 | 48 | 164 | *.971* | *22.5* | 131 | 266 |
| 9 | 146 | 152 | 93 | 53 | 188 | *.959* | *22.5* | 145 | 278 |
| 1960 | 140 | 160 | 95 | 45 | 111 | *.970* | *22.5* | 128 | 276 |
| 1 | 138 | 158 | 100 | 38 | 330 | *1.013* | *22.5* | 162 | 265 |
| 2 | 140 | 156 | 101 | 39 | 351 | *1.069* | *22.5* | 161 | 259 |
| 3 | 137 | 151 | 98 | 39 | 375 | *1.078* | *22.5* | 154 | 256 |
| 4 | 137 | 150 | 95 | 42 | 210 | *1.079* | *22.5* | 150 | 218 |
| 5 | 129 | 157 | 96 | 33 | 305 | *1.078* | *22.5* | 154 | 216 |
| 6 | 129 | 164 | 97 | 32 | 237 | *1.077* | *22.5* | 151 | 222 |
| 7 | 139 | 157 | 103 | 36 | 254 | *1.079* | *22.5* | 152 | 221 |
| 8 | | 153 | 104 | | 204 | *1.078* | *22.0* | 147 | 230 |
| 9 (6 mos.) | | 154 | | | | *1.077* | *21.5* | | |
| Source | (19) | (7) | (20) | (22) | (3) | (8) | (23) | (10) | (2) |

Note: Production cost data for 1964-68 were obtained by averaging the unit production costs of three companies whose output represented 34% of units made in Canada in 1968. From 1961 to 1963 two companies were averaged and data prior to 1961 are from only one company whose costs were always below average.

CHART 20
ELECTRIC RANGES

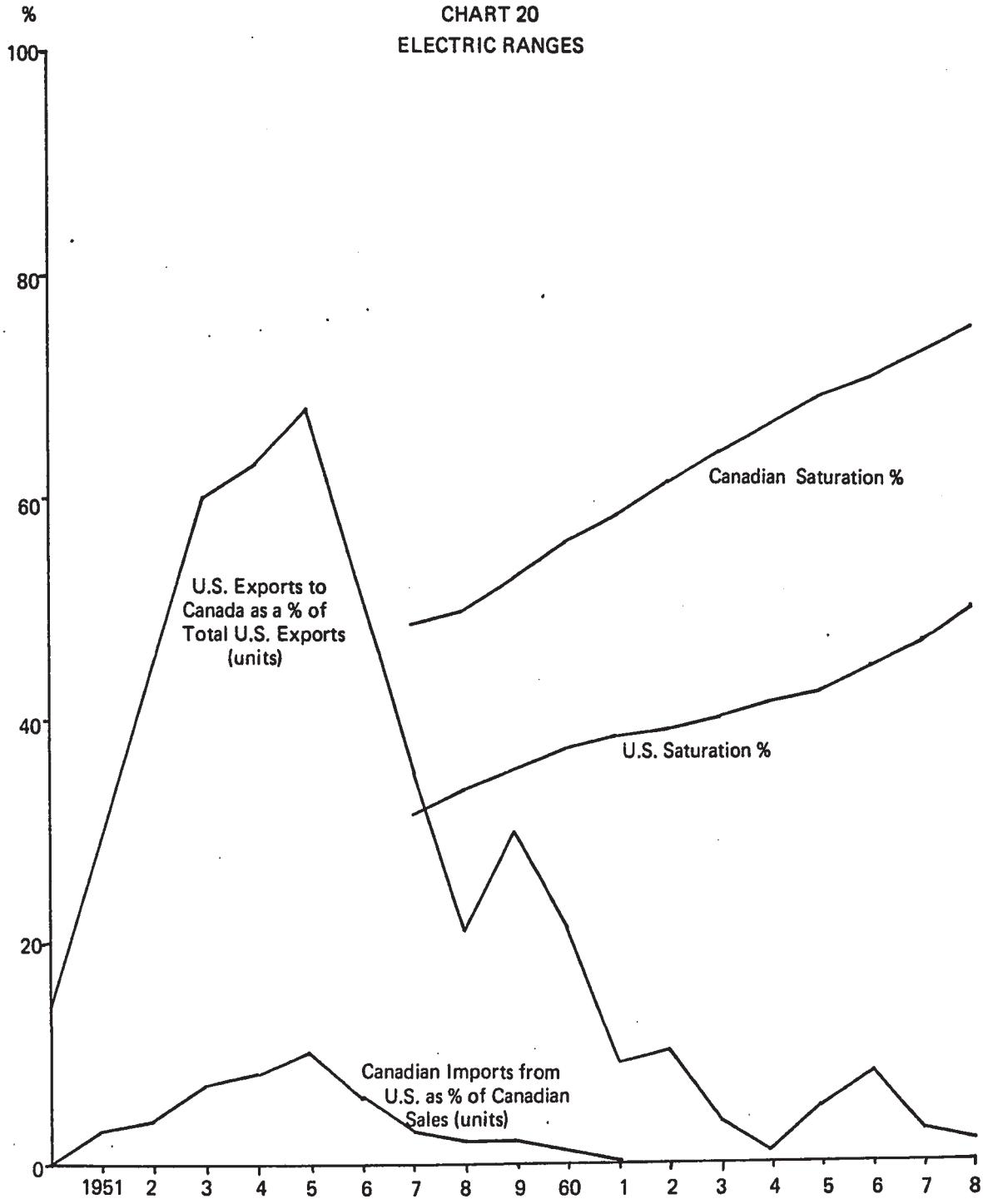


CHART 21
ELECTRIC RANGES

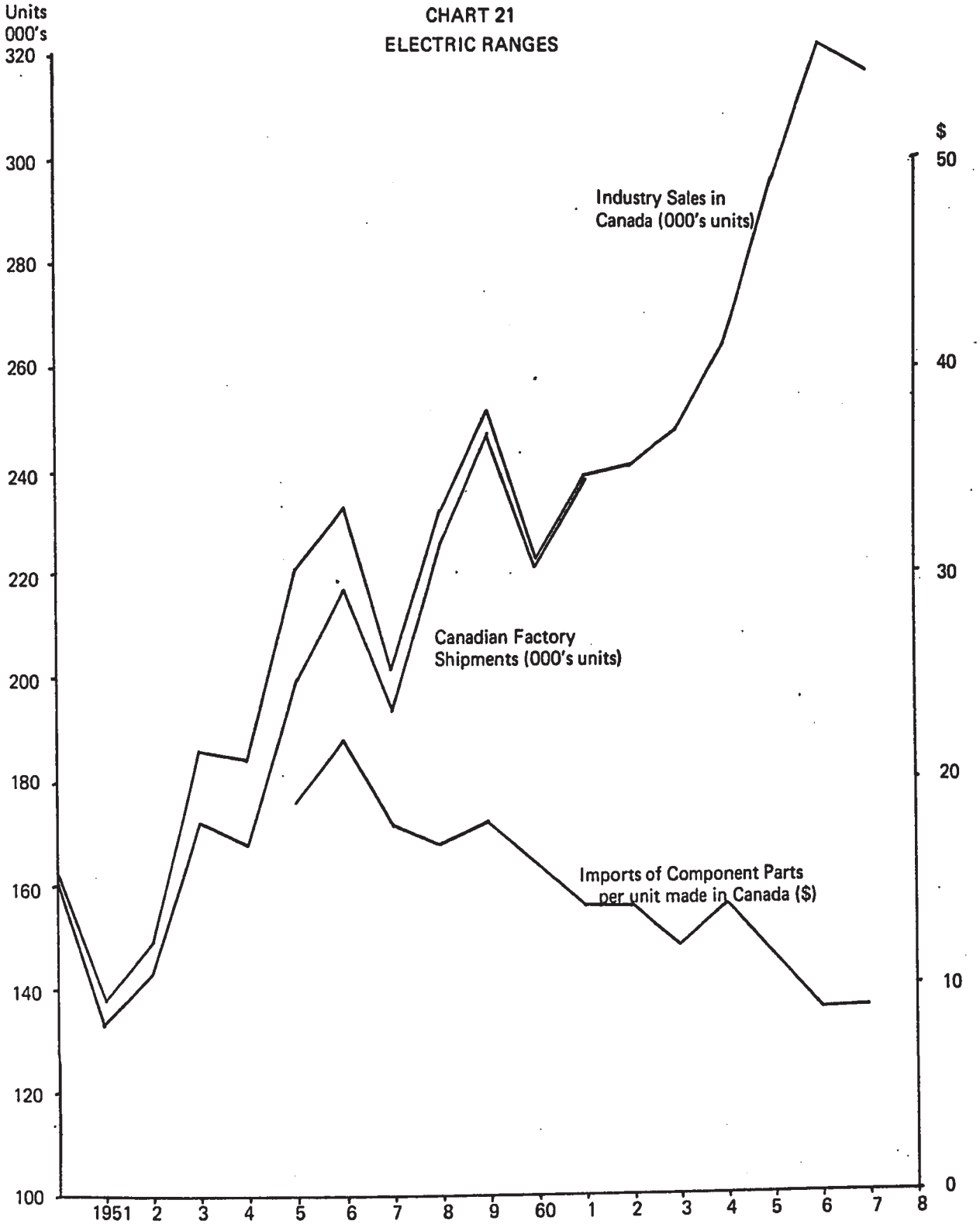
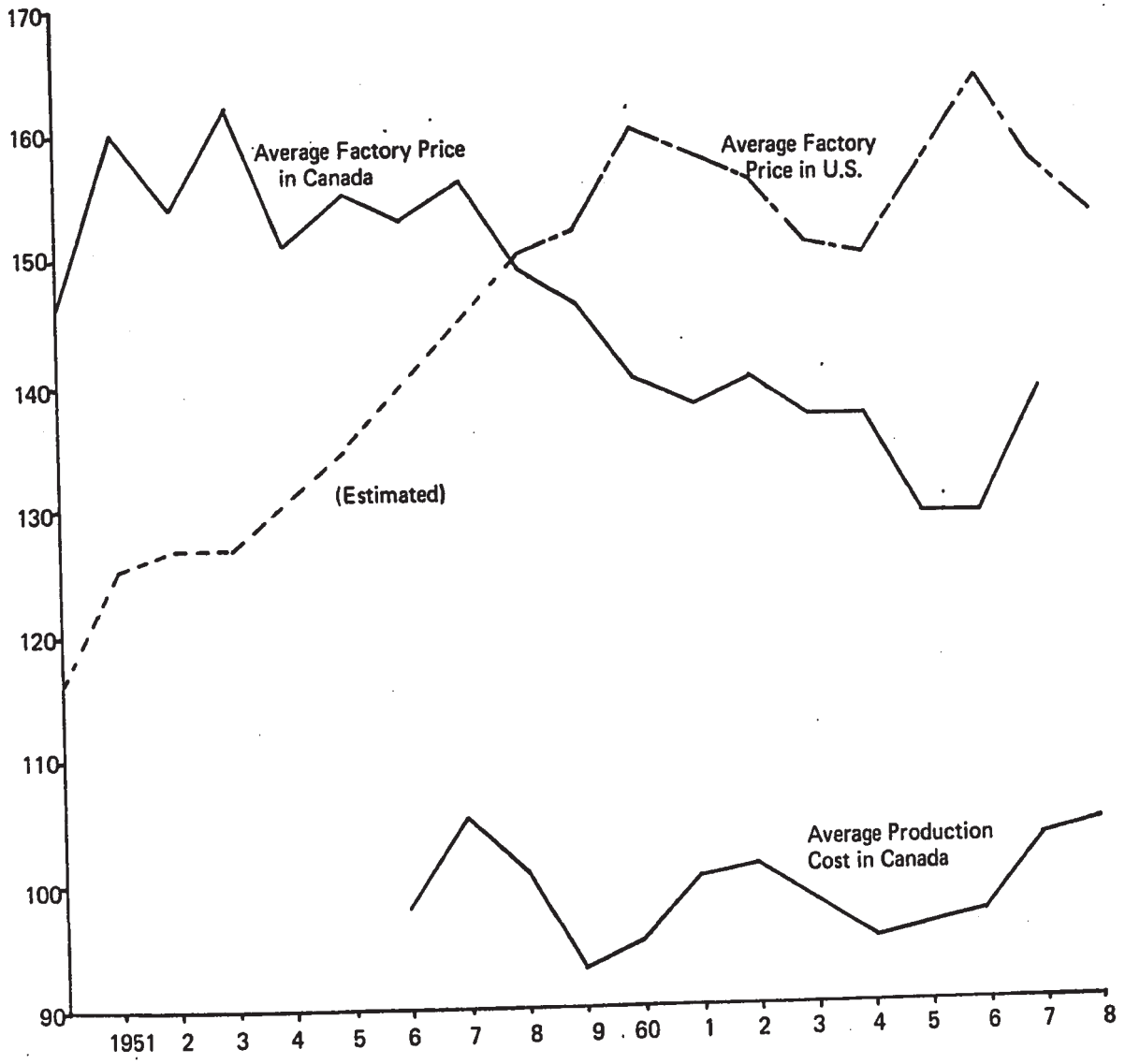


CHART 22
ELECTRIC RANGES



# CHAPTER XIII

## GAS RANGES

The standards legislation did not, of course, affect the gas range and trade flows have felt only the hindrance of the tariff. In these conditions, U.S. exports to Canada reached a very substantial percentage of Canadian sales after trade restrictions were lifted in 1951. As Chart 23 shows, imports from the U.S. reached a peak of 54% in 1955 and then declined gradually to a low of 7% in 1967 - a very familiar pattern.

As mentioned previously, saturation of gas ranges in the U.S. was considerably higher than Canadian saturation, and, as Chart 23 depicts, the level in both countries was declining.

It is difficult to draw consistent meaning from the price data in Table 18. In Canada, gas ranges did cost a little more to manufacture than electrics (given the same model, size, features, etc.). Yet the average factory price of gas ranges was lower for most years in both Canada

and the U.S. One obvious explanation for this is that the product mix was different, largely because many gas ranges were for use in cottages, trailers, and other locations where wiring is uneconomical. In such locations, small-size, economy units are common. Thus a large percentage of gas ranges was thought to be smaller-sized units without automatic controls. A rough indication of size trends in Canada was obtained as follows:

| | Electric Ranges | | Gas Ranges | |
|---|---|---|---|---|
| | Under 28" | Over 28" | Under 28" | Over 28" |
| 1965 | 34% | 66% | 43% | 57% |
| 1966 | 29 | 71 | 42 | 58 |
| 1967 | 29 | 71 | 40 | 60 |

Source: CAMA.

Clearly, smaller units constituted a greater percentage of gas range sales, and, in both categories, sales of smaller units were weakening. Furthermore, it was estimated that, of the small-sized electric units, 43% had automatic clock controls in 1967, compared to 22% for small-sized gas units. Although this data supports the idea that more gas ranges were smaller units without special features, it appears to be insufficient to explain the rapid rise in average price of gas ranges in the U.S. It was generally thought that sales to mobile homes and cottages were increasing, and one is left with the unverified assumption that sales to these users were changing towards larger,

more sophisticated ranges.

It should be mentioned that the very large increase in average retail selling price in the U.S. is partly accounted for by the growing acceptance of double-oven ranges. However, as the following data show, gas ranges of all types have enjoyed increased prices since 1962.

The only explanation that fits these trends and explains the gradual price rise in all models is the increasing acceptance of gas self-cleaning ranges, which had achieved national distribution by the end of 1968. It was not known what share of the gas range market was held by self-cleaners in the U.S. It was known that gas self-cleaners had not reached Canadian consumers by 1968, and, as Table 18 shows, average gas range prices in Canada had been fairly stable since 1957.

According to Table 18 it would appear that gas ranges were an exception in terms of their export prices from the U.S. The U.S. average factory price was consistently above the average export price, and the landed cost of exports to Canada was considerably below the Canadian factory price. As a matter of fact it was exports to Canada that pulled down the average export price. In view of the wide fluctuations in the landed price in Canada one may doubt the accuracy of the published statistics. One alternative explanation unable to be verified

| | Free-Standing | | Double-Oven | | Built-In | | Set-In | |
|---|---|---|---|---|---|---|---|---|
| | % of Mkt. | Av.Price | % of Mkt. | Av.Price | % of Mkt. | Av.Price | % of Mkt. | Av.Price |
| 1962 | 75.9% | $159 | n/a | n/a | 18.2% | $205 | 5.9% | n/a |
| 1964 | 68.0 | 165 | 6.9% | $324 | 15.9 | 225 | 9.2 | $167 |
| 1966 | 70.5 | 165 | 11.5 | 335 | 10.7 | 234 | 7.3 | 180 |
| 1968 | 74.8 | 180 | 12.0 | 360 | 8.1 | 250 | 5.1 | 170 |

Source: Merchandising Week

is that many small gas ranges were exported to Canada in mobile homes. The gas range seemed to be regarded as a dying product in Canada and few statistics were available. Furthermore, there was considerable divergence between U.S. export statistics and Canadian import statistics on this product. Component parts imports proved to be impossible to isolate in either U.S. export of Canadian import statistics.

# TABLE 17
## GAS RANGES
## U.S.—Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | |
|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. |
| 1950 | 66.2 | | 15.4 | 23 | 78.9 | 20 | | |
| 1 | 57.4 | | 23.7 | 41 | 91.6 | 26 | | |
| 2 | 61.2 | | 22.8 | 37 | 64.5 | 35 | | |
| 3 | 61.7 | | 29.9 | 48 | 79.3 | 38 | | |
| 4 | 59.7 | | 31.8 | 53 | 91.5 | 35 | | |
| 5 | 68.0 | | 36.5 | 54 | 101.7 | 36 | | |
| 6 | 67.5 | 2,177 | 31.5 | 47 | 105.8 | 30 | | |
| 7 | 63.3 | 1,969 | 28.3 | 45 | 98.9 | 29 | 19.7 | |
| 8 | 64.2 | 1,884 | 26.5 | 41 | 90.6 | 29 | 21.6 | |
| 9 | 85.5 | 2,012 | 49.0 | 38 | 115.0 | 43 | 21.9 | |
| 1960 | 45.8 | 1,814 | 13.7 | 30 | 69.5 | 20 | 21.2 | |
| 1 | 43.3 | 1,830 | 11.4 | 26 | 69.3 | 16 | 20.3 | |
| 2 | 45.0 | 1,981 | 8.6 | 19 | 65.4 | 13 | 19.6 | |
| 3 | 47.8 | 2,072 | 6.6 | 14 | 59.8 | 11 | 18.6 | |
| 4 | 53.1 | 2,170 | 7.5 | 14 | 58.4 | 13 | 18.2 | 62.7 |
| 5 | 47.6 | 2,266 | 4.6 | 10 | 53.5 | 9 | 17.3 | 61.0 |
| 6 | 46.1 | 2,163 | 3.9 | 8 | 55.5 | 7 | 17.2 | 59.7 |
| 7 | 47.8 | 2,123 | 3.5 | 7 | 49.5 | 7 | 16.5 | 57.3 |
| 8 | 49.0E | 2,272 | 8.4 | 17 | 46.0 | 18 | | |
| 9 (6 mos.) | | | | | | | | |
| Source | (18) | (2) | (3) | | (3) | | (4) | (2) |

# TABLE 18
## GAS RANGES
## U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 91 | | 66 | *1.070* | *22.5* | 56 | |
| 1 | 100 | | 66 | *1.052* | *22.5* | 59 | |
| 2 | 106 | | 86 | *.979* | *22.5* | 73 | |
| 3 | 116 | | 90 | *.983* | *22.5* | 74 | |
| 4 | 111 | | 70 | *.973* | *22.5* | 65 | |
| 5 | 108 | | 75 | *.986* | *22.5* | 68 | |
| 6 | 115 | 73 | 90 | *.984* | *22.5* | 74 | 135 |
| 7 | 128 | 75 | 94 | *.959* | *22.5* | 75 | 135 |
| 8 | 135 | 77 | 86 | *.971* | *22.5* | 76 | 137 |
| 9 | 139 | 77 | 43 | *.959* | *22.5* | 62 (1) | 140 |
| 1960 | 136 | 87 | 109 | *.970* | *22.5* | 90 | 150 |
| 1 | 140 | 89 | 103 | *1.013* | *22.5* | 88 | 150 |
| 2 | 132 | 95 | 98 | *1.069* | *22.5* | 86 | 158 |
| 3 | 126 | 110 | 96 | *1.078* | *22.5* | 87 | 187 |
| 4 | 129 | 128 | 89 | *1.079* | *22.5* | 89 | 186 |
| 5 | 132 | 139 | 98 | *1.078* | *22.5* | 90 | 191 |
| 6 | 125 | 143 | 63 | *1.077* | *22.5* | 92 | 193 |
| 7 | 130 | 138 | 86 | *1.079* | *22.5* | 96 | 195 |
| 8 | | 135 | 88 | *1.078* | *22.0* | 97 | 203 |
| 9 | | | | | *21.5* | | |
| Source | (19) | (*) | (3) | (8) | (23) | (3) | (2) |

*Calculated using retail margins from Table 16 on Electric Ranges.

(1) Possible recording error.

CHART 23
GAS RANGES

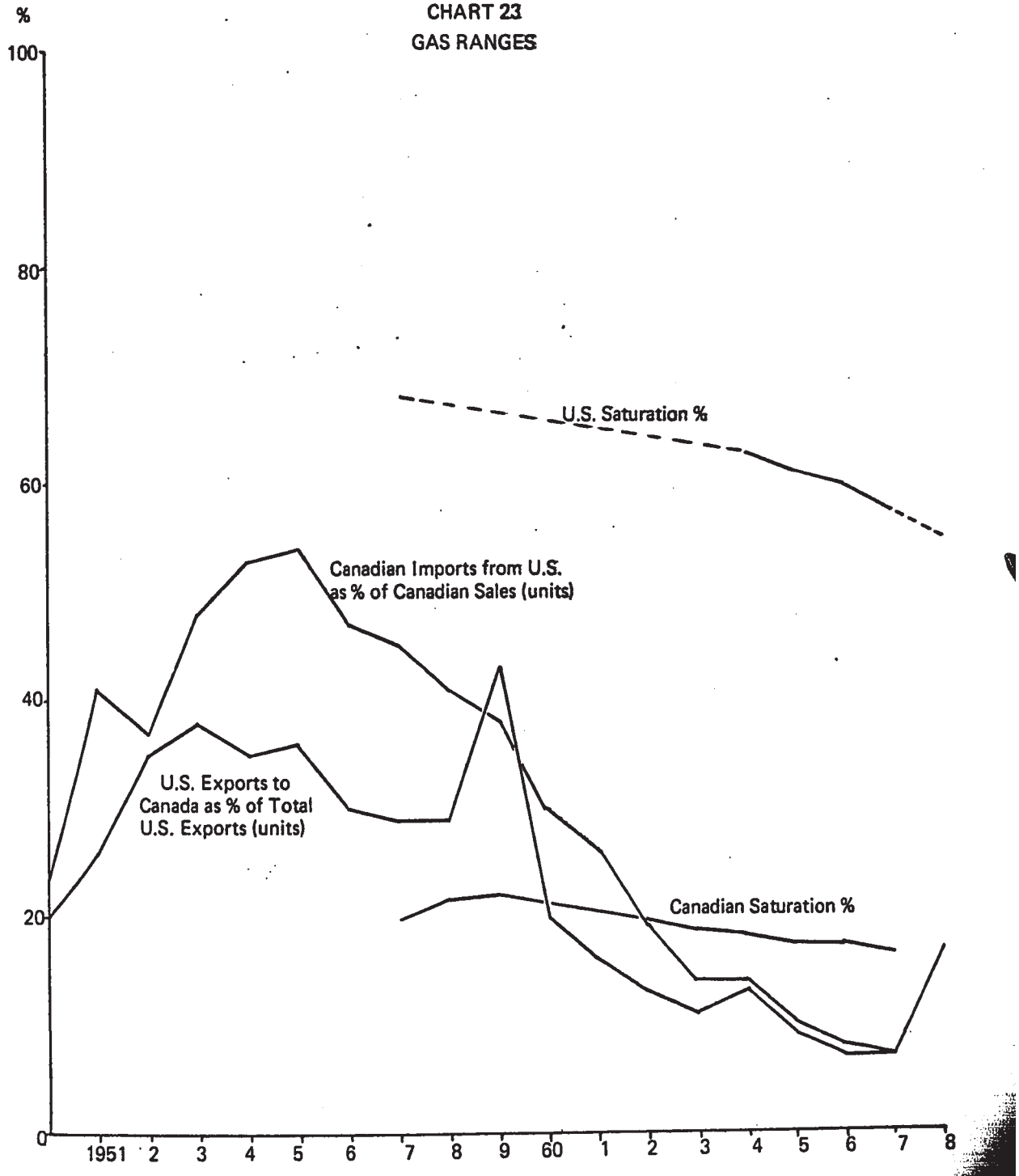
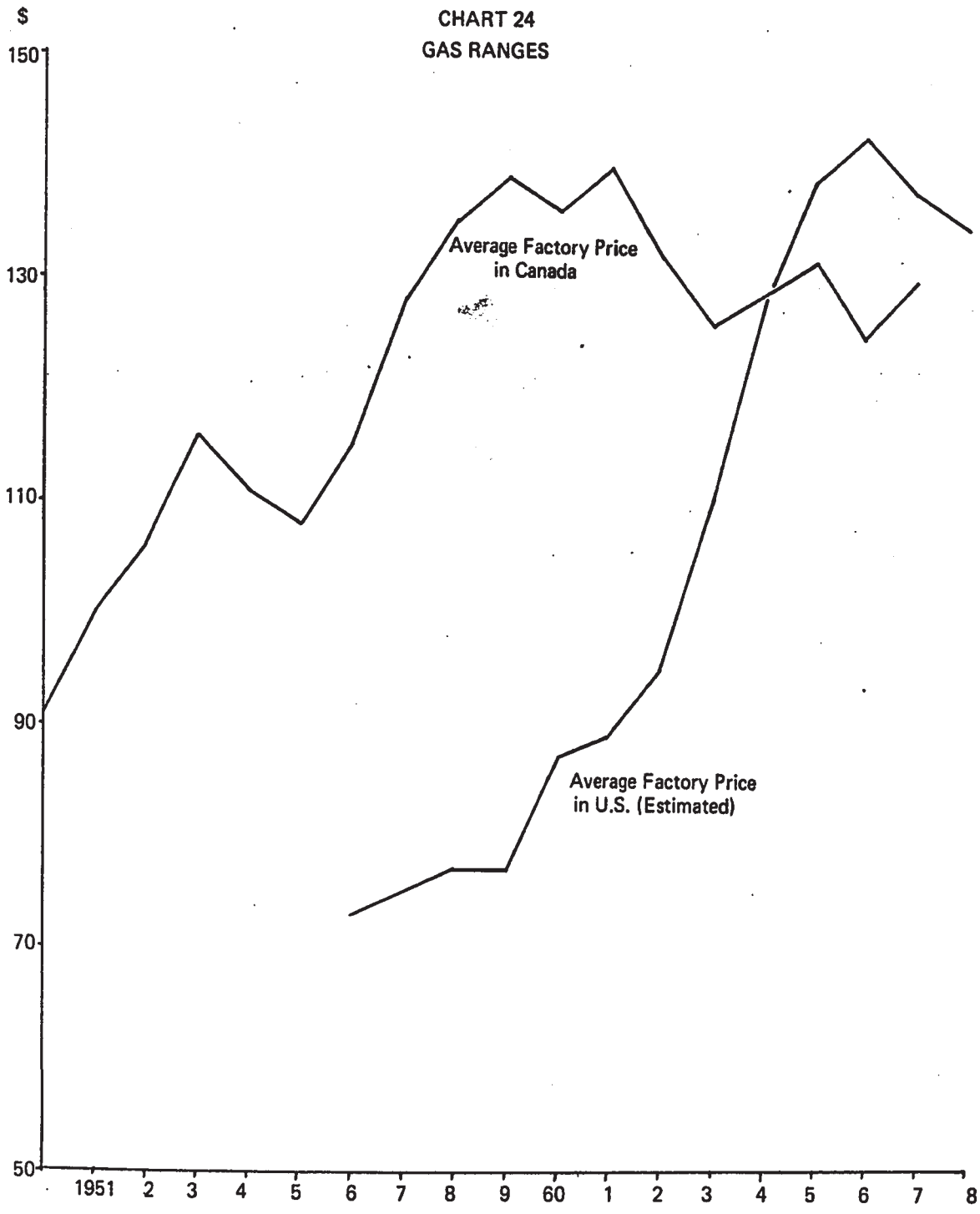


CHART 24
GAS RANGES



## CHAPTER XIV

## BLACK AND WHITE TELEVISION

Black and white television sets were first sold in Canada in 1949 when factory shipments were 9,200 units at an average price of $218. Sales grew very rapidly from this point, reaching a peak of 812,000 by 1955 - a volume that has never been achieved since (see Table 19). During this time of early rapid growth in Canadian sales, very few units were imported at all, which would seem to be totally contrary to the pattern in other products. Looking at sales volume in the U.S. in the early years referred to above, Table 19 shows the extent to which the U.S. market was ahead of the Canadian market. In 1949, three million sets were sold in the U.S. compared to 9,200 in Canada. The question is why, under these expected conditions of U.S. leadership in saturation, did Canadian firms not import to a greater degree? In 1955, for example, imports were only 6,000 units while sales from domestic production were 806,000. As Chart 25 shows, imports were never a significant percentage of Canadian sales until the late 1960's.

The reason for this unexpected pattern in trade flows was not difficult to determine. Evidently, RCA Limited held certain patents known as the Parker patents, which restricted television imports into Canada from all foreign producers with the exception of Zenith. Thus Canadian producers enjoyed a very insulated domestic market for many years during which both imports and exports of television sets were negligible. These patents expired in 1966, at which time imports jumped substantially, particularly from Japan. Since sales of black and white sets in Canada began to decline in 1967 due to displacement by color, the period when U.S. exports to Canada could have been high was over. The future pointed to increasing Japanese domination of the Canadian market for black and white portables.

IMPORTS OF BLACK AND WHITE TELEVISION SETS INTO CANADA

| | From | Units | Value | Unit Value |
|---|---|---|---|---|
| 1964 | Japan | 1,031 | 67 | 65 |
| | U.S.A. | 30,003 | 3,429 | 114 |
| 1965 | Japan | 23,413 | 1,028 | 44 |
| | U.S.A. | 30,946 | 3,152 | 102 |
| 1966 | Japan | 50,896 | 3,137 | 62 |
| | U.S.A. | 46,303 | 8,680 | 188 |
| 1967 | Japan | 120,456 | 7,259 | 58 |
| | U.S.A. | 38,001 | 6,693 | 176 |
| 1968 | Japan | 153,884 | 8,250 | 54 |
| | U.S.A. | 39,891 | 4,703 | 130 |
| Jan-June 1969 | Japan | 45,839 | 2,604 | 57 |
| | U.S.A. | 14,672 | 1,690 | 115 |

Source: DBS 65-007 (item 637-21), less industry estimates of color imports.

Again we see imports from Japan at prices well below Canadian factory prices and imports from the U.S. at landed costs generally higher than Canadian factory prices (see Chart 26). Imports from Japan were largely at the initiative of Canadian television manufacturers and department stores. It was believed that department stores took the lead on this occasion and that manufacturers followed suit in order to give their dealers competitive models. Imports from the U.S., on the other hand, still included Zenith and other firms who marketed directly in Canada, which helped to account for the U.S. price premium.

All television imports from Japan were portable units. It was altogether impractical for the Japanese to try to export cabinetry to Canada. On the other hand, imports from the U.S. were thought to include many console sets. This was a further explanation for the size of the price differential in imports from the two countries. In this connection it was interesting to observe the trend in the Canadian market towards small screen portables and the average factory price behavior of each type of set, as follows:

Industry sources indicated that some 420,000 black and white portables were sold in 1968, 200,000 of which were in the "under 19"" category. Total black and white sales were 608,000 units. The general industry forecast called for a steady decline in black and white sales down to

| | Portables | | Consoles | | 3-way Combination (Radio-TV-Phono) | | |
|---|---|---|---|---|---|---|---|
| | % of Mkt. | Price | % of Mkt. | Price | % of Mkt. | Price | Total |
| 1959 | 42.8 | $135 | 53.4 | $174 | 3.8 | $246 | 100% |
| 1961 | 37.3 | 136 | 54.3 | 172 | 8.4 | 241 | 100% |
| 1963 | 38.0 | 109 | 54.5 | 156 | 7.5 | 300 | 100% |
| 1965 | 51.1 | 98 | 43.3 | 172 | 5.6 | 346 | 100% |
| 1967 | 59.4 | 98 | 38.2 | 139 | 2.4 | 287 | 100% |

Source: Electronic Industries Association of Canada.

420,000 units in 1973. Of this amount portables were expected to account for 340,000 units or 81% and 200,000 of these will be under 19" in screen size.

From the foregoing data it seemed clear that the expected trend in the Canadian market favored the Japanese, and that they would take an increasing share of the market over time. It was also clear that the average price of Japanese exports to Canada was lower than the average Canadian factory price for portables alone. It may also be observed from Table 20 that the average price of U.S. exports was higher for most years than the average U.S. factory price. U.S. exports after 1963 were believed to have included a number of color sets, and it was not possible to separate them from black and white exports.

In view of the large difference between the average factory price in Canada and that in the U.S., we would not expect to see any significant exports of Canadian sets to the U.S. The Canadian factory price of portables alone was higher than the average U.S. factory price of all sets. It was therefore unlikely that Canadian firms could compete with U.S. firms in third countries unless Canadians possessed either preferential tariff access or special marketing contacts. A glance at DBS export statistics would tend to confirm this, except for certain years when exports to the U.S. were particularly high. Other Canadian exports were widely dispersed among many nations and

never in significant volume. However, as the following DBS extract shows, Canadian firms exported heavily to the U.S. in 1966 and 1967 with some carryover into 1968 and 1969.

CANADIAN TELEVISION EXPORTS

| | | Units | Value $000's | $ Unit Value |
|---|---|---|---|---|
| 1963 | U.S. | 2,711 | 690 | 255 (1) |
| | Total | 6,946 | 1,275 | 184 |
| 1964 | U.S. | 2,505 | 630 | 251 (1) |
| | Total | 14,249 | 2,255 | 158 |
| 1965 | U.S. | 742 | 192 | 259 |
| | Total | 10,774 | 1,486 | 138 |
| 1966 | U.S. | 90,018 | 9,809 | 109 |
| | Total | 95,043 | 10,459 | 110 |
| 1967 | U.S. | 49,811 | 5,755 | 116 |
| | Total | 51,575 | 5,986 | 116 |
| 1968 | U.S. | 4,016 | 1,051 | 262 (2) |
| | Total | 7,497 | 1,564 | 209 |
| 6 mos. 1969 | U.S. | 12,168 | 1,957 | 161 (2) |
| | Total | 13,825 | 2,183 | 158 |

Source: DBS 65-004, item 637-20, 1967-8; item 630-70, 1965-66; item 630-37, 1964.

(1) Includes some exports of combination TV, ratio, phone units.

(2) Includes some exports of color sets.

A search for the reason behind these substantial shipments to the U.S. disclosed a somewhat deflating explanation. Over 95% of the exports in 1966 and 1967 were by a U.S. subsidiary to its parent to fill a temporary deficiency in the parent's production capacity. An expansion of the parent's facilities was completed in mid-1967,

after which the "exports" ceased. This same company was called upon for 3,000 color sets in 1968, and it was believed that most exports in 1969 were from subsidiary companies to their parents. There were two Canadian-owned companies attempting to sell color sets in the U.S., but the extent of their success was not known. From the average unit price of the sets exported in the first six months of 1969, however, it would appear that only about 25% of the units exported could have been color sets. The Canadian-owned firms had not been able to sell black and white sets in the U.S., so the other 75% were almost certainly subsidiary transfers.

Chart 26 shows that average factory prices had decreased over time in both Canada and the U.S. as might be expected of a product entering its decline stage. As illustrated earlier this price decrease held true for both portables and consoles. It was unfortunately not possible to obtain any aggregate measure of component parts imports over time, but the following extract from "U.S. exports (FT 410)" presented a clear indication of the extent of which Canadian television producers were dependent on U.S. electronics technology during the early years of the television boom.

Although the Parker patents were effective in eliminating most trade in finished sets, they certainly did not hinder trade flows in component parts. This was nowhere

# U.S. EXPORTS TO CANADA OF SELECTED TELEVISION COMPONENTS

| | TV Picture Tubes | | Capacitors | | Resistors | | Inductors | |
|---|---|---|---|---|---|---|---|---|
| | Units 000's | Unit Value | Total Value US $000's | % of U.S. Exports | Total Value US $000's | % of U.S. Exports | Total Value US $000's | % of U.S. Exports |
| 1952 | 54 | $21 | 1,696 | 48% | 565 | 30% | 1,370 | 50% |
| 1953 | 234 | 24 | 3,175 | 69 | 955 | 55 | 3,444 | 69 |
| 1954 | 306 | 21 | 2,441 | 55 | 1,038 | 48 | 2,760 | 62 |
| 1955 | 524 | 19 | 2,882 | 62 | 1,353 | 54 | 2,622 | 58 |
| 1956 | 180 | 18 | 2,568 | 47 | 1,047 | 37 | 1,627 | 39 |
| 1957 | 41 | 18 | 2,162 | 40 | 1,317 | 37 | 1,388 | 28 |
| 1958 | 44 | 18 | 2,286 | 42 | 1,263 | 33 | 904 | 18 |
| 1959 | 47 | 17 | 2,320 | 38 | 1,341 | 32 | 940 | 24 |
| 1960 | 17 | 17 | 2,553 | 34 | 1,734 | 32 | 943 | 23 |
| 1961 | 12 | 21 | 3,415 | 32 | 2,983 | 34 | 1,389 | 22 |
| 1962 | 12 | 20 | 3,926 | 34 | 3,738 | 35 | 1,427 | 27 |
| Item No. | 52-57 | 707815 | 707905 | | 707910 | | 707915 | |
| | 58-62 | 70832 | 70852 | | 70856 | | 70859 | |

Source: U.S. Exports, FT 410.

more evident than in the case of picture tubes. If the figures above are compared to Canadian production figures (industry sales less imports) we have the following interesting comparison.

DEVELOPMENT OF PICTURE TUBE PRODUCTION IN CANADA

| | Sets made in Canada 000's | Picture Tubes Imported 000's | Picture Tubes made in Canada 000's | Imports as a % of total tube requirements |
|---|---|---|---|---|
| 1952 | 139 | 54 | 85 | 39% |
| 1953 | 396 | 234 | 162 | 59 |
| 1954 | 613 | 306 | 307 | 50 |
| 1955 | 807 | 524 | 283 | 65 |
| 1956 | 615 | 180 | 435 | 29 |
| 1957 | 434 | 41 | 393 | 9 |
| 1958 | 432 | 44 | 388 | 10 |

What the above data suggest is that Canadian tube makers were unable to expand output fast enough to keep pace with the unprecedented rate of growth in consumer demand. The U.S. television industry, which produced over seven million sets as early as 1950, was able to supply the needed parts. It was unfortunately not possible to obtain data on parts imports prior to 1952 to observe the degree of Canadian dependence in earlier years. The import figures on capacitors, resistors and inductors again disclose the importance of Canada to U.S. exporters in the early stages of the product cycle.

It proved to be difficult to obtain representative

production costs from black and white television producers in Canada. Consoles cost a good deal more to make than do portables, and it is important in considering the costs of any one firm to appraise its production mix and compare it to the total industry mix. The figures given on Table 20 were derived from companies whose sales were somewhat less than 20% of total industry sales. A representative number of Japanese imports was included in deriving the average production costs so that they could be compared directly with the average factory prices. It was not possible to obtain production cost data for earlier years, and hence no trend in unit gross margin could be established. Industry executives were quick to point out that unit margins had eroded over time in black and white sets. The large difference between unit margins on color sets (see Table 22) and black and white sets was thought to be indicative of the erosion that black and white had experienced.

The presence of the Parker patents did in fact result in considerable distortion of trade flows of finished sets in the introductory stages of the product's life; trade flows from the innovator moved directly to the components stage. Early manufacturers in Canada, mostly U.S. subsidiaries, functioned essentially as assemblers of U.S. components. Gradually, Canada developed its own component manufacturing facilities and U.S. imports were displaced. As the product matured and the patents expired, Canadian

producers found themselves unable to compete with low-cost Japanese portable sets. Even prior to this, many Canadian components manufacturers had been eliminated by Japanese suppliers. The Japanese had evidently captured the market in the most popular types of tube and Canadian firms found themselves unable to sustain their overheads after losing so large a volume of business.

Thus over the twenty years that black and white sets had been available in Canada, the profile of the market had changed from one dominated by technological leadership (early years) to one dominated by scale economies and low cost production. The persistent trend away from cabinetry towards portable units tended over time to reduce the product to a commodity item. These were the conditions when color programming was introduced into Canada in 1966, ushering in a whole new cycle of displacement. In the narrative on color television which follows, it is significant to note how much more rapidly the Japanese have moved into low-priced competition and how quickly the consumer has moved towards portables.

# TABLE 19
## BLACK AND WHITE TELEVISION
### U.S.–Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | | Component Parts Imports | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's (Prod.) | Can. Imports from U.S. Units 000's | % Imports to Can. Sales | Total U.S. Exports Units 000's | U.S. Exports to Canada as a % of Total U.S. Exports | Can. | U.S. | Total Value Can. $000's | Value per Unit Made in Can. |
| 1950 | 33 | 7,464 | 1.4 | 4 | 36 | 4 | | | | |
| 1 | 49 | 5,385 | 2.1 | 4 | 92 | 2 | | | | |
| 2 | 142 | 6,096 | 2.7 | 2 | 82 | 3 | | | | |
| 3 | 409 | 7,216 | 12.6 | 3 | 119 | 11 | | | | |
| 4 | 630 | 7,347 | 16.9 | 3 | 105 | 16 | | | | |
| 5 | 812 | 7,756 | 4.7 | 1 | 77 | 6 | | | | |
| 6 | 622 | 7,387 | 7.3 | 1 | 149 | 5 | 53.6 | | | |
| 7 | 437 | 6,399 | 2.8 | 1 | 136 | 2 | 62.5 | | | |
| 8 | 446 | 4,920 | 13.7 | 3 | 148 | 6 | 69.7 | | | |
| 9 | 414 | 6,350 | 11.8 | 3 | 125 | 9 | 74.5 | | | |
| 1960 | 357 | 5,708 | 14.6 | 4 | 106 | 14 | 80.6 | | UNOBTAINABLE | |
| 1 | 367 | 6,178 | 20.7 | 6 | 131 | 16 | 84.0 | | | |
| 2 | 443 | 6,471 | 15.7 | 4 | 140 | 11 | 86.6 | | (See Narrative) | |
| 3 | 474 | 7,130 | 19.1 | 4 | 143 | 13 | 89.8 | | | |
| 4 | 594 | 8,107 | 31.0 | 5 | 308 (2) | | 91.0 | | | |
| 5 | 565 (1) | 8,382 | 30.7 | 5 | 295 (2) | | 92.6 | 97.1 | | |
| 6 | 661 (1) | 7,285 | 50.8 | 8 | 409 (2) | | 93.9 | 97.8 | | |
| 7 | 627 (1) | 5,104 | 35.4 | 6 | 300 (2) | | 94.5 | 98.1 | | |
| 8 | 608 (1) | 5,816 | 31.2 | 5 | 346 (2) | | 95.2 | 98.5 | | |
| 9 (6 mos.) | | | | | | | | | | |
| Source | (16) | (2) | (3) | | (3) | | (4) | (2) | | |

(1) Includes imports from Japan.
(2) Includes color sets (Merchandising Week data).

# TABLE 20
## BLACK AND WHITE TELEVISION
### U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Export Price on all Exports | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ | U.S. $ |
| 1950 | 235 | | | | 156 | *1.070* | *20* | 178 | 300 |
| 1 | 265 | | | | 286 | *1.052* | *20* | 183 | 292 |
| 2 | 212 | | | | 202 | *.979* | *20* | 168 | 282 |
| 3 | 207 | | | | 164 | *.983* | *20* | 172 | 280 |
| 4 | 173 | 140E | | | 139 | *.973* | *20* | 144 | 230 |
| 5 | 162 | 140E | | | 115 | *.986* | *20* | 130 | 225 |
| 6 | 154 | 126E | | | 123 | *.984* | *20* | 126 | 190 |
| 7 | 157 | 126E | | | 144 | *.959* | *20* | 134 | 190 |
| 8 | 157 | 136 | | | 160 | *.971* | *20* | 140 | 205 |
| 9 | 160 | 128 | | | 167 | *.959* | *20* | 141 | 213 |
| 1960 | 157 | 132 | | | 163 | *.970* | *20* | 139 | 222 |
| 1 | 166 | 123 | | | 161 | *1.013* | *20* | 129 | 209 |
| 2 | 164 | 129 | | | 196 | *1.069* | *20* | 129 | 192 |
| 3 | 152 | 121 | 126 | 26 | 152 (1) | *1.078* | *20* | 123 | 177 |
| 4 | 144 | 114 | | | 137 (1) | *1.079* | *20* | | 162 |
| 5 | 149 | 111 | 136 | 13 | 122 (1) | *1.078* | *20* | | 159 |
| 6 | 125 | 103 | 99 | 26 | 200 (1) | *1.077* | *20* | | 141 |
| 7 | 122 | 92 | 97 | 25 | 184 (1) | *1.079* | *20* | | 133 |
| 8 | | 92E | 99 | | 155 (1) | *1.078* | *19* | | 132 |
| 9 (6 mos.) | | | | | 132 (1) | *1.077* | *18* | | |
| Source | (17) | (24) | (20) | | (3) | (8) | (23) | (10)&(3) | (2) |

(1) Required an estimated adjustment to exclude color sets, and use of DBS data (65-007).

Note: Average production cost figures were derived from output of slightly less than 20% of Canadian sales. The output was representative of the total industry product mix in terms of consoles, portables and Japanese imports.

CHART 25

BLACK AND WHITE TELEVISION

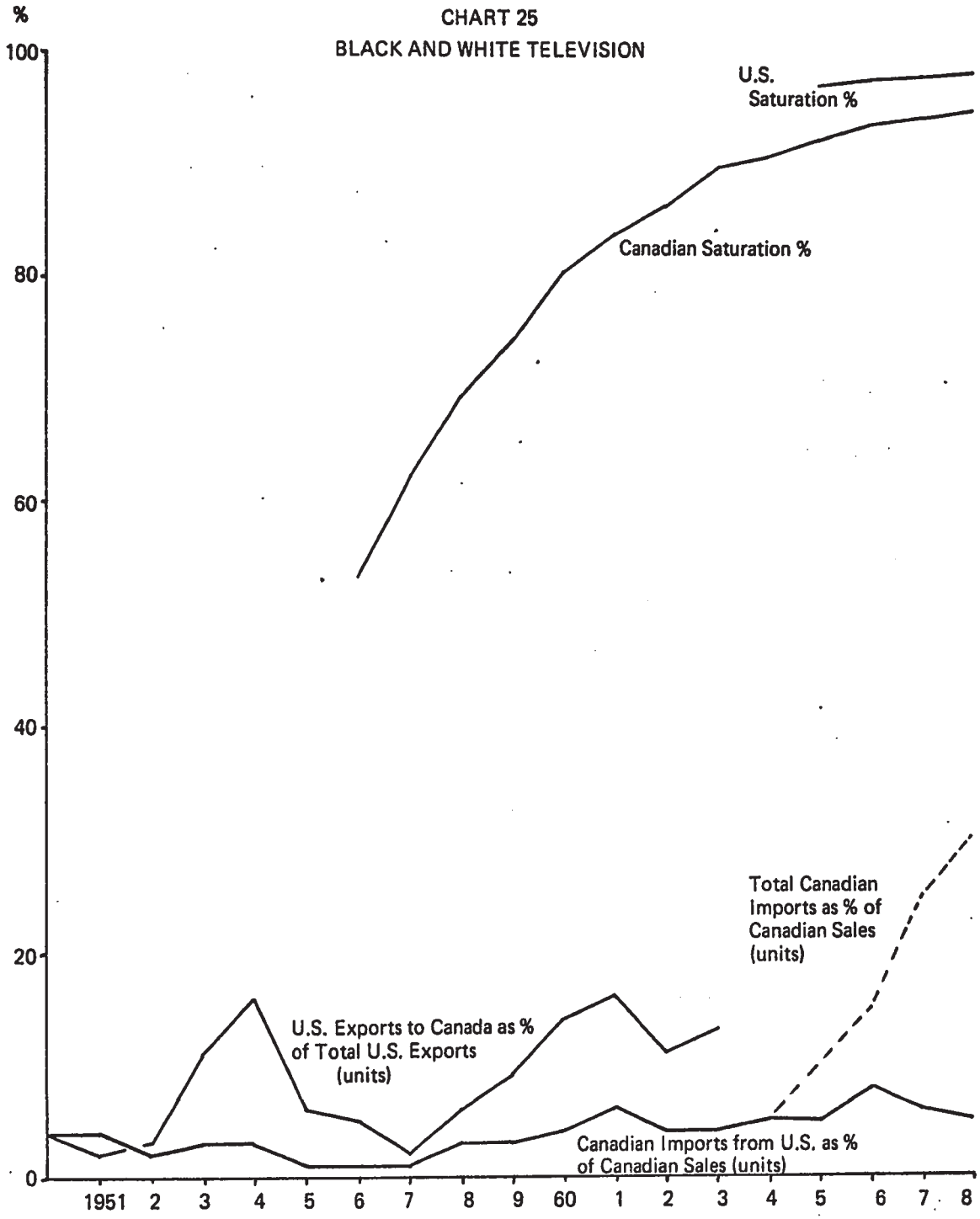
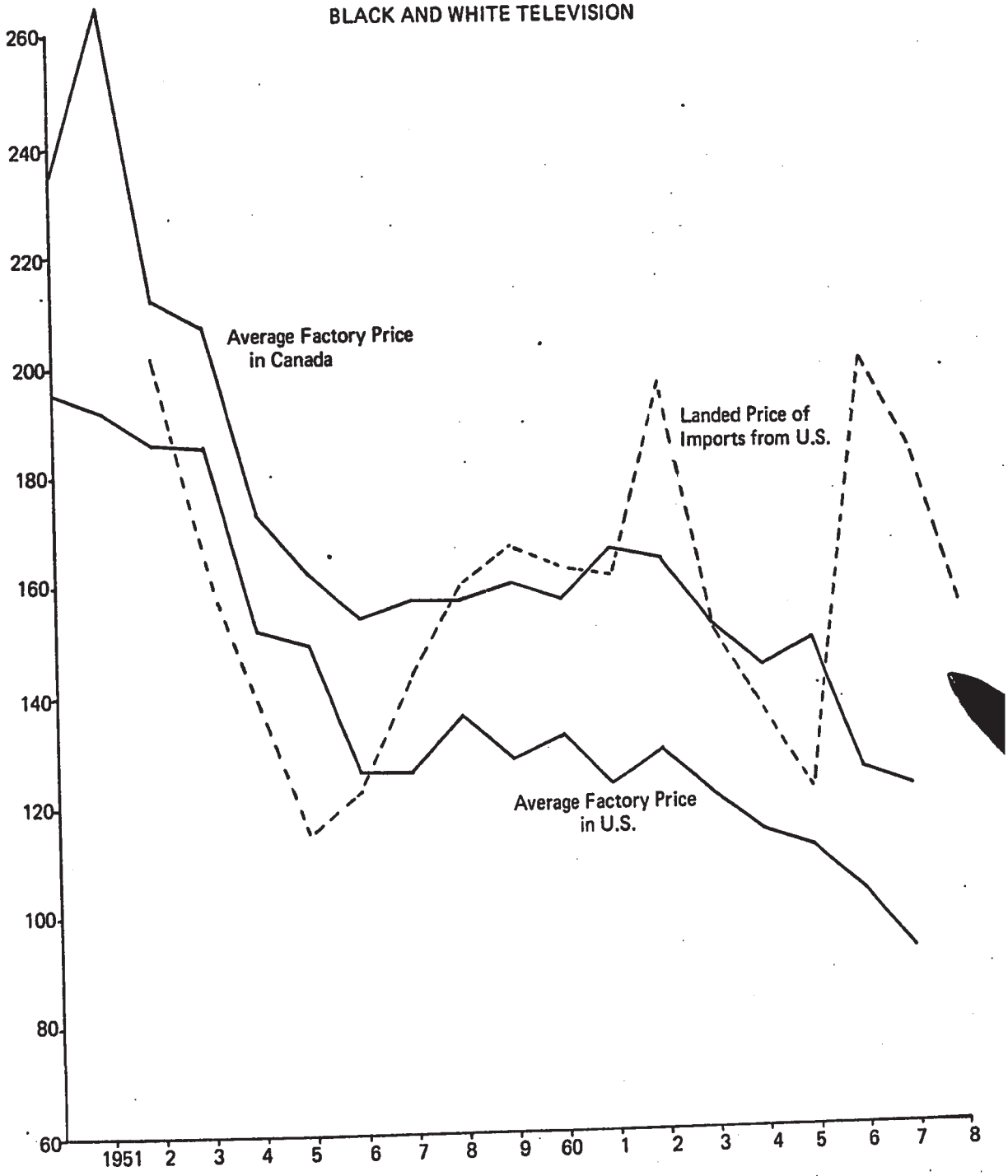


CHART 26
BLACK AND WHITE TELEVISION



# CHAPTER XV

## COLOR TELEVISION

The introduction of color television to the Canadian market constitutes an excellent example of the process of diffusion of product innovation in Canada. This was an occasion where the innovation was preceded by planned, purposeful research, in this case by RCA Limited - a leader in consumer electronics in the U.S.

The major research problem was to develop a color picture tube that could be manufactured at a reasonably competitive cost and that would not entail exorbitant costs in the design and wiring of the chassis. The RCA color tube design had led the way in the industry and was used in most television sets made in Canada. Chassis design on the other hand allowed more flexibility, and various companies had used their own research and engineering skills in attempts to create their own unique designs. Cabinets posed no problems that had not already been resolved via the manufacture of black and white sets. In fact Canadian companies were

quite competitive in the cost and quality of their cabinets and exported many to the U.S.

The first record of any substantial production of color sets in the U.S. was in 1956 when 100,000 sets were manufactured. Sales in the U.S. remained substantially at this annual volume until 1961, which saw the beginning of a dramatic increase in volume to over five million units in 1966. In 1967, Americans produced more color sets than they did black and white sets (see Tables 19 and 21) and the displacement was expected to continue. By the end of 1968, 35.7% of wired homes in the U.S. had color sets compared to approximately 7.7% in Canada. It is clear from Table 21 that Canadian saturation was approximately four years behind saturation in the U.S., about the same lag as in the inauguration of national color programming (1966 in Canada versus 1962 in the United States).

The first production of color sets in Canada was in 1963, when RCA assembled fewer than 1,000 units using U.S. components. At the same time approximately 1,800 units were imported from the U.S. In the following year twice the number of units were assembled in Canada and twice the number were imported. Sales in 1964 reached 5,000 sets, largely to cable TV users and residents of cities close to the U.S. border. At least one other U.S. subsidiary began to assemble a few sets in 1964, and, significantly, a Canadian owned company began its first assembly in 1964 using

the RCA color tube and chassis under license. U.S. subsidiaries assembling sets in Canada in 1964 estimated that they imported components from the U.S. valued at over $180 per unit.

The real breakthrough in color television in Canada came in 1966 when national color broadcasting was introduced. Sales in that year were 100,000 sets, with only 17% imported from the U.S., as opposed to 79% the previous year (see Table 21). Several other U.S. subsidiaries began to assemble in Canada in this year and at least two Canadian firms were involved. Components imports in 1966 were estimated at $133 per unit, down considerably from 1964 but up substantially in total dollars.

By 1968 sales in Canada had reached 188,000 units, with U.S. imports at 20% and components imports down to an estimated $55 per unit. Sales in 1969 reached 325,000 sets. These trends are graphically depicted in Chart 28. As Table 21 shows, U.S. production by this time had reached almost six million sets. Canadian production was becoming increasingly integrated and less reliant on foreign components. However, as early as 1966 Canadian producers began to experience import competition from countries other than the U.S. The speed with which this occurred and the process by which these imports reached Canadian consumers is very important and revealing.

Imports from the U.S. in 1966, 67 and 68 may be classified into two kinds. First, were imports by U.S. subsidiaries in Canada from their parent companies. These imports were initiated largely by those subsidiaries that were manufacturing in Canada with the objective of rounding out their line or supplementing their production. Many of these were top-of-the-line sets; the average value of imports from the U.S. in 1968 was $382, according to DBS data. Second, were imports from U.S. producers marketing a full line directly in Canada. Companies such as Zenith and Motorola were in this category; they marketed directly in Canada from their U.S. plants and followed fairly aggressive advertising and promotion policies.

Imports from other countries began to be felt as early as 1966, when 2,000 units came in from Japan and 6,800 units from the Netherlands. The average price of the Dutch imports was $300 and these were brought in by a Dutch subsidiary with an established marketing organization in Canada for consumer electronics. There may have been some black and white sets included in the number imported but it is thought that there were relatively few. This was a case of a Dutch multinational corporation mastering color television technology in its infancy and exporting from its technological strength and its marketing reach. The 2,000 Japanese color sets were believed to have been imported at the initiative of Canadian department stores at an average price of

$200. These were mostly private brand, portable units sold as the "low end" models. Since neither Canadian nor U.S. producers could match Japanese costs, they themselves began to import from Japan to provide their dealers with models that would be competitive with department store offerings. By 1968, imports from Japan had climbed to 27,000 units at an average price of $189. The vast majority of these imports were to either Canadian producers or department stores, although there was evidence that some Japanese producers were attempting to build a brand image in Canada and the U.S. so that they could participate in the huge marketing profits.

It is interesting to note that U.S. buyers also favored Japanese sources to a considerable degree, as the following data indicate.

The U.S. may in fact already have become a net importer of color television, and seemed to be destined to increase its imports over time as portables assumed a larger share of U.S. color sales.

U.S. COLOR TELEVISION SALES
BY TYPE (% OF UNITS)

| | Tables and Portables | Consoles | Combinations |
|---|---|---|---|
| 1965 | 12% | 80% | 8% |
| 1966 | 18 | 74 | 8 |
| 1967 | 32 | 61 | 7 |
| 1968 | 41 | 55 | 4 |

Source: Merchandising Week.

| | BLACK AND WHITE TELEVISION | | | | COLOR TELEVISION | | | |
|---|---|---|---|---|---|---|---|---|
| | U.S. Production | | Imports from Japan | | U.S. Production | | Imports from Japan | |
| | Units 000's | Fac.Price US $ | Units 000's | Avg.Price US $ | Units 000's | Fac.Price US $ | Units 000's | Avg.Price US $ |
| 1965 | 8,382 | 111 | 1,116 | 57 | 2,646 | 349 | n/a | n/a |
| 1966 | 7,285 | 103 | 1,321 | 51 | 5,118 | 396 | 240 | 182 |
| 1967 | 5,104 | 92 | 1,248 | 51 | 5,777 | 386 | 324 | 171 |
| 1968 | 5,816 | 92E | 1,771 | 48 | 5,982 | 374 | 734 | 154 |

Source: Merchandising Week

Clearly, portable models were taking an increasing share of color television sales in the U.S. and this was the area of Japanese competition. By way of comparison, black and white sets made in the U.S. were 90% portables in 1968 as compared to 60% in Canadian made sets. Approximately 30% of Canadian color sales in 1968 were table or portable models. It seems inevitable that, as the product category matures and loses its prestige image, portables assume an increasing share of the market; and portables are the more transportable and exportable type. The influence of the greater percentage of portables in U.S. production was part of the explanation for lower factory prices in the U.S. compared to Canada. For example, the U.S. average retail price of $132 for black and white sets in 1968 was composed of an average $125 price for portables and $190 for consoles and combinations. The relative weighting of portables was a major determinant of the ultimate average factory price.

It is obvious from Table 22 that gross margins had remained relatively attractive for color television in Canada. Prices and costs were both declining, and would doubtless continue to do so as sales of portables grew and the impact of the learning curve asserted itself on costs. The average landed price of U.S. exports to Canada was again well above the average Canadian production cost, indicating that most were consoles and that no attempt was made to underprice the Canadian market. Japanese units on the

other hand were strictly price competitive. What was rather surprising was the early stage in the product's life at which such price competition arose, and the reason for this appeared to be the aggressiveness of Canadian importers. There was, however, evidence that pointed to the emergence of some Japanese firms as innovators and marketers on a global scale.

Thus, in summary, we see the introduction of color television to the Canadian market initially by imports from the U.S. and shortly thereafter by assembly in Canada by the subsidiary of the innovating firm. This move to assemble in Canada was substantially influenced by the presence of a 20% tariff barrier. Assembly soon became more integrated in Canada as fewer components per unit were imported. Canadian-owned firms moved relatively early into assembly operations and have since become less dependent for components except for the picture tube. Production in Canada increased to over 80% of Canadian sales and component imports dropped below $55 per unit. Some components were already being sourced to lower cost suppliers such as the Japanese. The industry forecast was for further rapid growth in color sales reaching 500-550 thousand units by 1973. Many firms felt this was overly optimistic, but 1969 proved to be spectacularly successful as sales reached a total of 325,000 sets. It did seem clear, however, that color portables would increase their market share, and would stimulate further Japanese imports - especially in view of the 1969 decline in the

tariff rate to 15%.

The Color Tube

One very critical decision made by RCA in 1966 was to build a color tube plant in Canada. As mentioned earlier, the color tube comprised the object of most of the original research. Its manufacture on a large scale was regarded as one of the most complex mass production jobs ever attempted. Over 20% of the tubes manufactured were rejected as inadequate.

It was therefore of considerable importance to follow the decision process of RCA as closely as possible to determine how great an effect the import tariff had on it. In doing so one cannot help but be impressed by the considerable uncertainty involved in some of the critical assumptions that had to be made in appraising the investment decision. The important parameters were as follows:

(a) Sales of color sets in the U.S. doubled in 1966 over 1965, leaving RCA - the dominant supplier - with insufficient tube capacity. RCA therefore planned to expand its tube production in some location.

(b) The Canadian market for color sets was expected to take off in 1966 with the introduction of national color programming.

(c) Canadian tube producers had tariff free access to

the expanding U.K. market, and RCA had marketing reach there as well as in Europe.

(d) Minimum economic capacity for a full-line color tube plant was judged by the company to be equivalent to 300,000 tubes annually.

(e) Tubes coming into Canada faced a 20% tariff barrier.

In the light of these major constraints, RCA chose to proceed with construction of a full-line tube plant in Midland, Ontario - an area which qualified for government investment assistance. The following critical marketing assumptions were made.

1. That RCA would capture most of the Canadian demand for tubes. U.S. producers would be unable to compete with RCA over the 20% tariff barrier, and other companies would be reluctant to move into manufacturing operations in Canada because of the size of the market.

2. That substantial sales would be made to the U.K. and Europe via the RCA marketing connections.

3. That the balance of production would temporarily be exported to RCA in the U.S. to help cope with the expected volume increase there in 1967.

The plant was completed in the summer of 1966 and was in full-scale production by the spring of 1967, after

several months of struggling to keep up with burgeoning demand. No sooner had full capacity been achieved, however, than events took an unexpected turn for the worse. U.S. demand slowed down to such a degree that 1967 sales barely exceeded those in 1966 and U.S. component suppliers were well able to cope. The British and European markets were developing more slowly than had been expected. And finally two powerful competitors decided to build color tube plants in Canada. First, Sylvania built a partially-integrated, "assembly" plant capable of producing 50,000 tubes annually, by June 1967, and they subsequently bought out the Fleetwood Corporation - a Canadian manufacturer and marketer of consumer electronics - partly to secure a marketing outlet for their tube output. By January of 1968, Canadian General Electric had also completed a major color tube plant with an annual capacity estimated at 200,000 units. The C.G.E. plant was designed to manufacture 15" tubes for use in portables, and most of their output was scheduled for export via their parent company to the U.S.

Thus the years 1967 and 1968 presented many problems to the ambitious RCA tube plant. In 1969 a further, though not unexpected blow, occurred as the U.S. raised its import tariff on picture tubes from 12% to 24% - enough to blunt Canadian export possibilities. The U.S. move was not unexpected because the picture tube had been classified some time earlier as a "glass" based product, but the higher levy

had been postponed because the U.S. market had grown faster than its suppliers could cope. It was believed that the growing rate of Canadian tube exports to the U.S. accelerated the process. The timing of the U.S. action was a particularly hard blow to C.G.E. and also to RCA. These companies immediately began to work towards an arrangement by which they could import and export equivalent values of different sized picture tubes duty free - a form of corporate rationalization plan. The year 1969 did, however, bring some favorable developments to RCA as the British and European markets began to develop (U.S. exporters faced a 17 1/2% tariff barrier into the U.K.), and the Canadian market expanded rapidly.

The purpose of outlining the details of the foregoing developments was to highlight the uncertainties inherent at the innovation stages of a product's life, and to underline the importance of the tariff structure in attracting this critical component industry to Canada. Certainly without the tariff RCA could have minimized its risks by expanding facilities at a more gradual rate in the United States. Two final comments are perhaps in order concerning the foregoing events.

The first is that as late as 1969 there were believed to be significant differences in the quality of picture tubes produced by different manufacturers. RCA attempted to keep its production processes secret. Although the differences

might not be detectable by end-users, they were well-known to engineers in companies who purchased tubes for inclusion in their brand of color sets. Thus the color picture tube was still regarded as a differentiated product, and commanded good profit margins of its own.

The second comment relates to the rationale underlying the decisions by C.G.E. and Sylvania to enter into production in Canada in competition with RCA. It is believed the following factors were involved:

(a) If they bought from RCA, they feared being unable to compete at the finished product level. RCA in this connection was in a monopoly position and could price up to the tariff wall.

(b) They feared being left behind in an important area of electronics technology.

(c) They may have arranged a private tariff agreement allowing them to import from their parent companies tubes of the sizes they did not make, tariff free up to the value of the tubes they exported.

Sales and Excise Taxes

One point that was raised often by manufacturers was the impact of Canadian sales and excise tax legislation on the Canadian propensity to import new products with high research and marketing cost elements. Sales and excise taxes were levied on manufacturers and importers at

the rate of 27% on distributor selling price, or 18.5% of factory price to dealers. However, when a product was imported the taxes was assessed on the duty-paid value - which was supposed to reflect distributor price in the country of origin plus the tariff.

In Japan, however, distributors were not normally used and the concept of a distributor price was something of a fiction. Also when department stores or manufacturers imported, or sub-contracted, on a private brand basis, no market existed in the country of origin for the private brand. In these circumstances, the taxes were assessed on the buying price plus duty, which had the effect of eliminating marketing costs from the assessment base. One company did in fact find it profitable to sub-contract one of its product lines to a small Canadian manufacturer so that sales and excise taxes would be assessed on their buying price from the sub-contractor, instead of their selling price which had to recover research and marketing costs.

The complaint levelled by many executives was that the present procedure tended to ignore research and marketing costs and to encourage importation or private branding of products with high research and marketing costs. It was also felt that the impact of these taxes on the final retail price was not recognized by Canadian consumers when they compared prices to those advertised in the U.S., where

such taxes were not levied.

# TABLE 21
## COLOR TELEVISION
### U.S.–Canadian Industry Statistics

| | Industry Unit Sales | | | | | | Saturation % | |
|---|---|---|---|---|---|---|---|---|
| | Canada 000's | U.S. 000's(Prod.) | Can. Imports from U.S. Units 000's | % U.S. Imports to Can. Sales | Total Can. Imports | % Total Imports to Can. Sales | Can. | U.S. |
| 1950 | | | | | | | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | 100 | | | | | | |
| 7 | | 85 | | | | | | |
| 8 | | 80 | | | | | | |
| 9 | | 90 | | | | | | |
| 1960 | | 120 | | | | | | |
| 1 | | 147 | | | | | | |
| 2 | | 438 | | | | | | |
| 3 | 2.5 | 747 | 1.8 | 72 | 1.8 | 72 | | 3.5E |
| 4 | 5.0 | 1,463 | 3.5 | 70 | 3.5 | 70 | | 5.0E |
| 5 | 12.0 | 2,646 | 9.5 | 79 | 9.5 | 79 | .4 | 9.5 |
| 6 | 100.0 | 5,118 | 17.0 | 17 | 25.8 | 26 | 2.4 | 15.0 |
| 7 | 120.0 | 5,777 | 21.0 | 18 | 41.2 | 34 | 4.5 | 26.2 |
| 8 | 188.0 | 5,982 | 37.4 | 20 | 67.6 | 36 | 7.7 | 35.7 |
| 9 (6 mos.) | | | 26.2 | | 45.0 | | | |
| Source | (6) | (2) | (5) | | (5)&(15) | | (6) | (2) |

# TABLE 22
## COLOR TELEVISION
### U.S.—Canadian Price Statistics

| | Average Factory Price | | Average Prod. Cost in Canada | Average Gross Margin in Canada | Average Landed Cost of U.S. Exports to Canada | | | Average U.S. Retail Price |
|---|---|---|---|---|---|---|---|---|
| | Canada Can. $ | U.S. U.S. $ | Can. $ | Can. $ | Can. $ | Exchange | Duty % | U.S. $ |
| 1960 | | 392 | | | | | | 610 |
| 1 | | 382 | | | | | | 566 |
| 2 | | 352 | | | | | | 555 |
| 3 | 600 | 345 | | | | | | 551 |
| 4 | 600 | 358 | | | 480E | *1.079* | *20* | 560 |
| 5 | 542 | 349 | | | 480E | *1.078* | *20* | 535 |
| 6 | 522 | 396 | 389 | 133 | 458E | *1.077* | *20* | 525 |
| 7 | 500 | 386 | 352 | 148 | 458E | *1.079* | *20* | 510 |
| 8 | 441 | 374E | 330 | 111 | 455 | *1.078* | *19* | |
| 9 (6 mos.) | | | | | | *1.077* | *15* | |
| Source | (5) | (24) | (20) | | (15) | (8) | (9) | (2) |

Note: Production costs were obtained by taking a weighted average unit cost of production of three manufacturers whose output amounted to 40% of total Canadian production in 1968. Average factory price reflects sales of units produced in Canada by these companies. It does not, therefore, reflect the impact of foreign portables.

CHART 27
COLOR TELEVISION

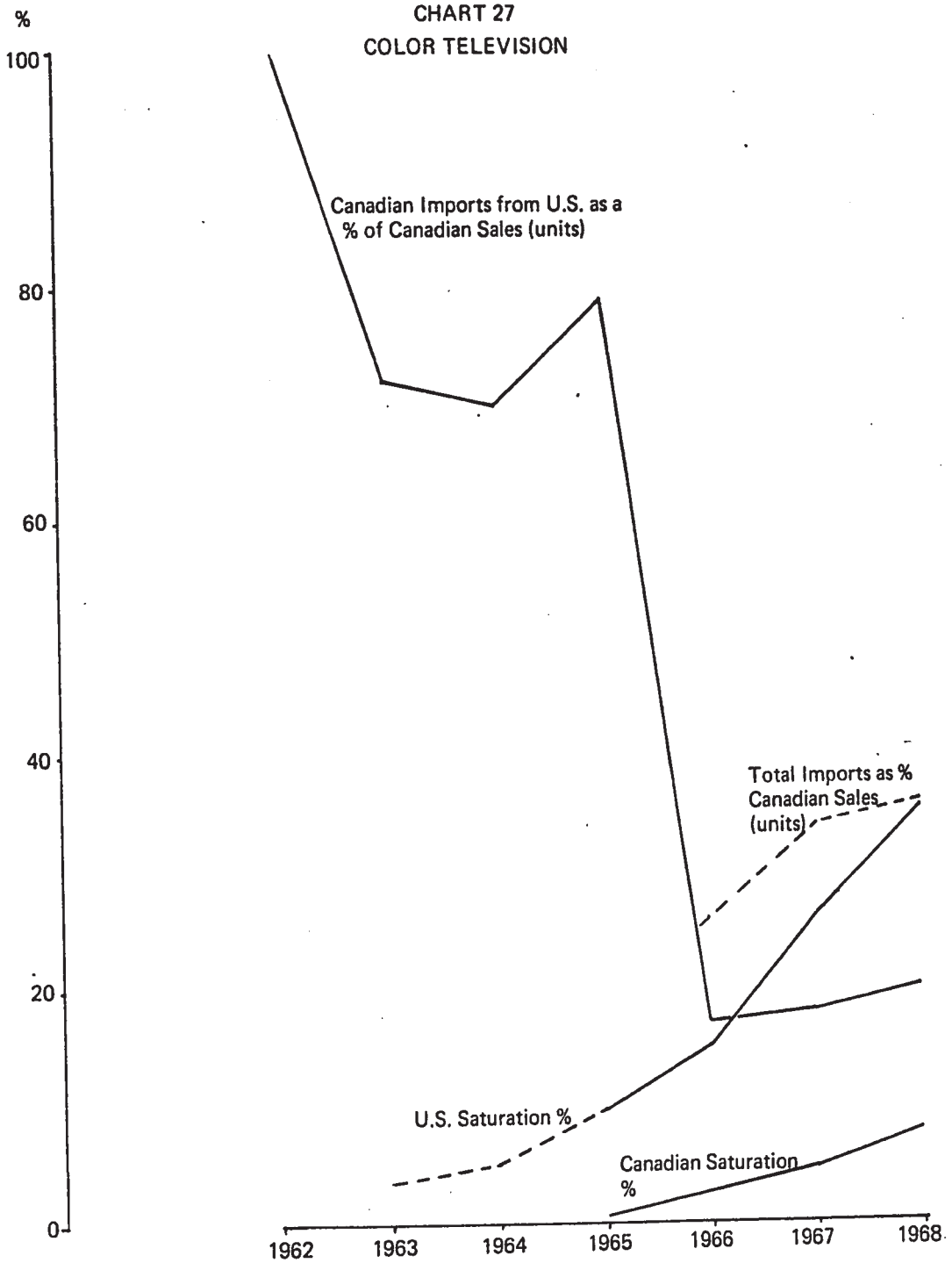


CHART 28
COLOR TELEVISION

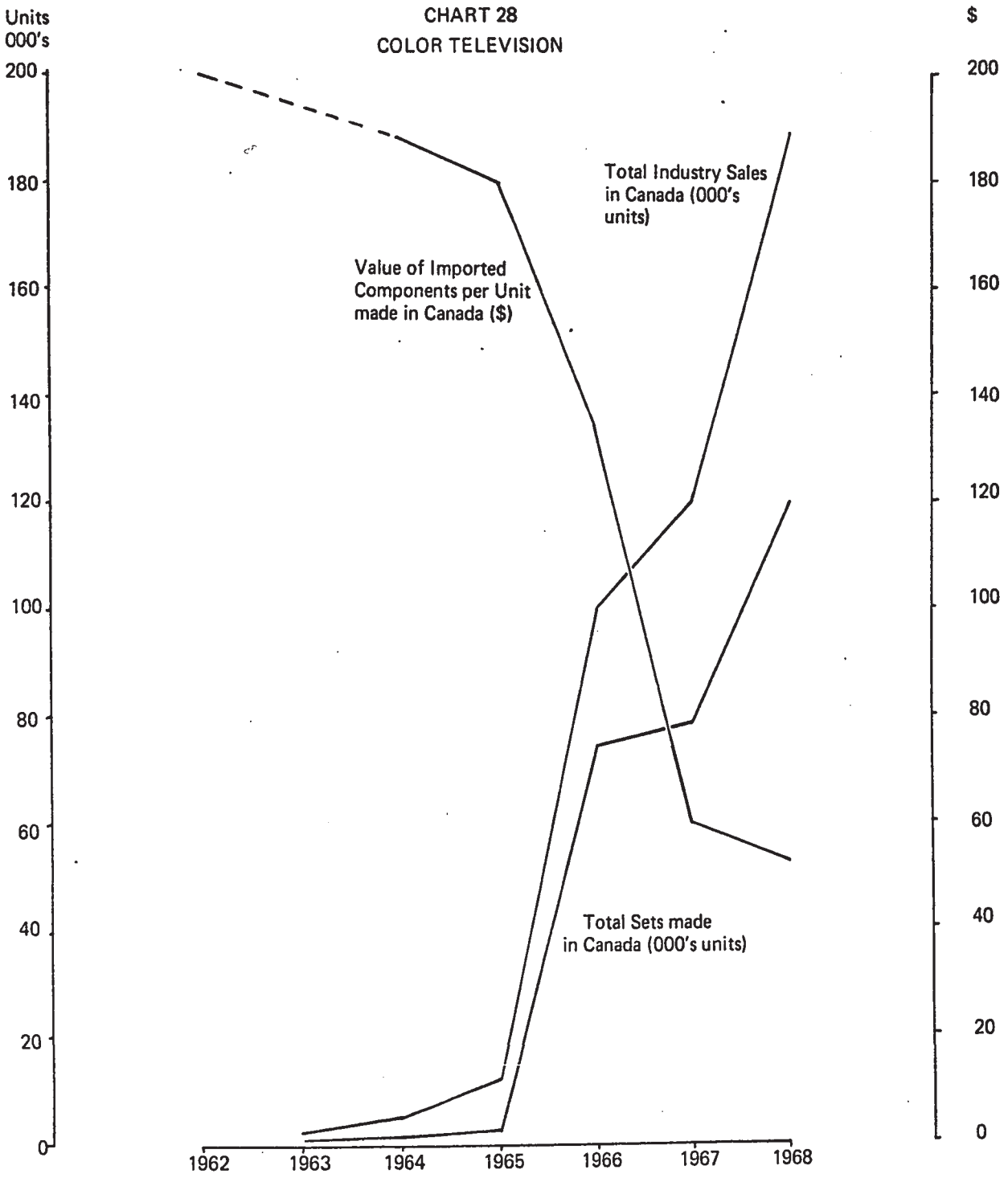
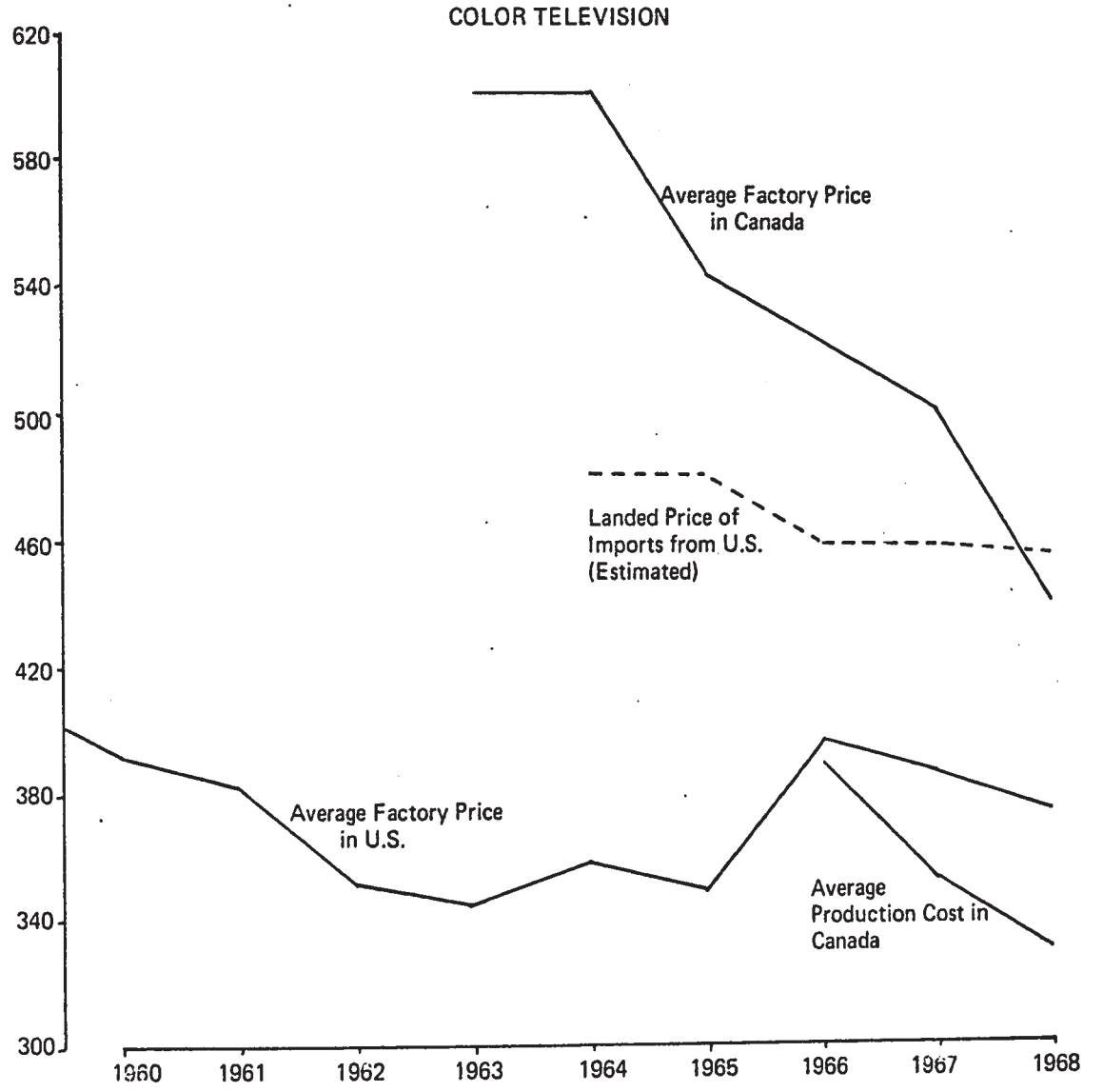


CHART 29
COLOR TELEVISION



PART 3

# CHAPTER XVI

## A LOOK AT THE CRITICAL MEASURES

### 1. Canadian Imports from the U.S. as a Percentage of Canadian Sales

It has been suggested that Canada is not an innovative country, and will therefore seldom be first in the development of any particular product. Indeed, because of the Canadian tendency to follow developments originated elsewhere - particularly in the U.S. - we expected to find that Canada would have a high propensity to import manufactured goods in the early stages of their life cycles. Our examination of trade patterns in each major appliance (plus television) has yielded the following information.

As discussed earlier, trade in electric ranges and black-and-white television was hindered by effective non-tariff barriers, and flows in these products were not exposed to the forces of international competition. Such hindrances may not normally influence product cycle behaviour in terms of the adoption curve, but clearly would distort any attempt to relate Canadian import propensity to

| Product | Locus of Innovation | Approximate Canadian Time Lag(yrs) | Imports from Innovator as Percentage of Canadian Sales 1952 | 53-56 | 57-60 | 61-64 | 65-68 |
|---|---|---|---|---|---|---|---|
| Dishwashers | USA | 11 | 100 | 90 | 93 | 50 | 36 |
| Air Conditioners | USA | 11+ | NIL | NIL | 100 | 45 | 33 |
| Freezers | USA | 6 | 75 | 79 | 44 | 6 | 2 |
| Auto Washers | USA | 11 | 18 | 32 | 31 | 16 | 10 |
| Wringer Washers | USA | n.a. (1) | 3 | 5 | 3 | 2 | 2 |
| Clothes Dryers | USA | 4 | 100 | 19 | 18 | 10 | 7 |
| Twin-Tubs (3) | UK | n.a. | NIL | NIL | NIL | 100 | 35 |
| Refrigerators | USA | 10 | 42 | 30 | 23 | 6 | 3 |
| Side-by-Sides (3) | USA | 3 | NIL | NIL | NIL | 100 | 15 |
| Electric Ranges | USA | n.a. (2) | 4 | 8 | 2 | 1 | 0 |
| Gas Ranges | USA | n.a. (2) | 35 | 47 | 39 | 20 | 10 |
| Black-and-White Television | USA | 5 (est) | 2 | 2 | 3 | 5 | 6 |
| Colour Television (3) | USA | 4 | NIL | NIL | NIL | 70 | 20 |

Canadian Time Lag = Number of Years after 1957 required for Canadian saturation to achieve U.S. 1957 level.

1. Saturation levels in both countries had been declining to 1957.

2. Saturation levels vary widely by product.

3. Data is for the single years 1964 and 1968 only.

NOTE: It was originally intended to measure changes in import propensity as products entered various stages of their life cycles. Actual sales data was much more erratic than the life cycle concept might suggest, and it was impossible to use sales growth or saturation patterns as the basis for determining life cycle stages for all products. On the other hand, import propensity, and other variables, were changing dramatically over time, and it seemed therefore desirable to show the direction of change over consecutive time periods as above.

| Product | Locus of Innovation | Approximate Canadian Time Lag(yrs) | Imports from Innovator as Percentage of Canadian Sales 1952 | 53-56 | 57-60 | 61-64 | 65-68 |
|---|---|---|---|---|---|---|---|
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| Air Conditioners | USA | 11+ | NIL | NIL | 100 | 45 | 33 |
| Freezers | USA | 6 | 75 | 79 | 44 | 6 | 2 |
| Auto Washers | USA | 11 | 18 | 32 | 31 | 16 | 10 |
| Wringer Washers | USA | n.a. (1) | 3 | 5 | 3 | 2 | 2 |
| Clothes Dryers | USA | 4 | 100 | 19 | 18 | 10 | 7 |
| Twin-Tubs (3) | UK | n.a. | NIL | NIL | NIL | 100 | 35 |
| Refrigerators | USA | 10 | 42 | 30 | 23 | 6 | 3 |
| Side-by-Sides (3) | USA | 3 | NIL | NIL | NIL | 100 | 15 |
| Electric Ranges | USA | n.a. (2) | 4 | 8 | 2 | 1 | 0 |
| Gas Ranges | USA | n.a. (2) | 35 | 47 | 39 | 20 | 10 |
| Black-and-White Television | USA | 5 (est) | 2 | 2 | 3 | 5 | 6 |
| Colour Television (3) | USA | 4 | NIL | NIL | NIL | 70 | 20 |

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it. Eliminating these two products from the analysis for this purpose, we have readings on eleven products. Of these, seven allow us to observe four changes in import propensity, three yield one observation, and one yields two observations for a total of 33 observations. One expectation is that the Canadian import propensity would decrease over time, and the observations support this with 27 observations decreasing, five observations increasing and one observation remaining unchanged.

It is interesting to examine the five increases for possible explanations. In the first place a monotomistic decline in import propensity cannot be expected. The timing of entry of Canadian producers would more likely give rise to periodic steps in the decline pattern. The process of averaging sequential four year blocks of data was intended to minimise this effect, as well as minor fluctuations arising from the competitive struggle between importers and Canadian producers where relevant. It appears that one general explanation can be summoned, however, to explain, at least in part, the reason for four of the observed increases in import propensity. This is the impact of the 1948-50 trade embargo discussed earlier. When imports resumed after the embargo they climbed at varying speeds for several years before the process of displacement took hold. Hence for several products the period from 1953-56 yielded a higher import propensity than the single year 1952.

## 2. The Canadian Propensity to Import Component Parts from the Innovating Country

It was expected that Canadian producers would begin manufacturing operations on an assembly basis, and then, as production output increased, would gradually displace imported components with their own manufacture. Executives of appliance firms in Canada confirmed in general terms that this process was part of their own conscious strategy. The reasons advanced tended to fall into two general categories:

1. To minimize investment until a basic market share is established.
2. To avoid costly research and design activity.

In addition to these underlying reasons was the observation made by many subsidiary managers that it took some considerable time to improve on the landed cost of imported components when they were obtained via parent company purchasing power. This was a relationship most Canadian independents did not have, and it appeared that they were, as a result, faster in the process of displacing imported components.

The second underlying reason - to avoid costly research - is very important and invites further comment. The clearly established trend in the appliance industry in Canada was for U.S. subsidiaries to introduce new products

from their parent company's product line. When they moved to assembly operations they tended to import components from their parent company production systems, because they knew they would be consistent with the product's design and performance standards. Even when imported components were displaced by Canadian production the specifications were normally laid down by the appliance maker to meet the exact specifications of the imported component, or were produced using parent company tooling. The point to be made is that this process results in identical product offerings to those made in the U.S. By avoiding the research and design investment, Canadian firms forego any possibility of unique product advantage. This is why it is so difficult for Canadian appliance makers to export back to the U.S. or to compete with the U.S. in third countries.

Even Canadian-owned companies tended to follow this pattern when they moved into new product areas. There were several examples of Canadian imdependents entering into licensing agreements with U.S. firms and assembling U.S. designed products in Canada. Initially all components were imported from the licensor, but over time these imports were displaced by Canadian-sourced components. The economic pressure for this displacement apparently began to assert itself at lower volume levels.

These observations have important implications for

Canada's international competitiveness in appliances. It has been suggested that, if Canadians could reduce their costs of production, they would be better able to export into the U.S. market. The removal of tariffs on imported components has been recommended as a way to reduce Canadian costs. However, unless Canadians could land products in the U.S., at prices below U.S. prices, they would not be successful exporters of copied product designs. The removal of the component tariff would clearly not enable Canadians to do this and would not therefore stimulate exports. What it promises to do is paralyze the displacement process. As new products, such as the side-by-side or color television, are introduced, Canadians would likely become assemblers only. Integrated manufacturing in Canada would tend to decrease over time, and Canadian manufacturers would become even further committed to U.S. designs and product features, without even the facilities required for originality.

It turned out to be very difficult to get reliable quantitative data from published sources on trade flows of component parts. Often the value of parts is included by DBS in the value of finished goods, or in some miscellaneous gathering account. Vast discrepancies exist between DBS import data on components and U.S. export data, and it was impossible to separate replacement parts from component parts.

The following figures were drawn largely from U.S. export data (FT 410) or from importing companies in Canada. They represent the landed cost of components imported from the U.S. for each unit made in Canada.

In addition to the above data, it is known that components for side-by-sides and self-cleaning ovens are being imported at present and that plans are already underway that will result in the displacement of some of these imports in the next two or three years. Furthermore, the data already presented on black-and-white television picture tubes illustrates a clear and quite dramatic displacement process in that component. An examination of these data does indicate a gradual decrease in the value of component parts imports per unit made in Canada. This effect could be due either to a decrease in U.S. export prices or a decrease in the actual quantities of components imported. The companies interviewed claimed that the latter was the case, although it was not possible to develop hard data to verify this, except in the case of certain television components where statistics were available in both units and value.

3. Import-Export Price Comparisons

If the cycle concept is an accurate reflection of reality in international trade, we would expect to find firms in the innovating country exporting products or models that were high priced relative to their domestic average factory price. The reason for this is that "top-of-the line" models usually contain the latest feature innovations,

| Product | Source | Component imports from U.S. for each unit made in Canada 1957-60 | 1961-64 | 1965-68 |
|---|---|---|---|---|
| Dishwashers | Companies (60-64) FT 410 (65-68) | | $60 | $48 |
| Air Conditioners | Company data | | 63 | 44 |
| Auto Washers | FT 410* | $54 | 51 | 42 |
| Refrigerators | FT 410 | 26 | 25 | 18 |
| Electric Ranges | FT 410 | 17 | 13 | 9 |
| Color T.V. | Company data | | 188 | 79 |

* May include some wringer washer, and clothes drier parts.

and, when the entire product concept is new, there is no reason to reduce price in order to gain exports. Furthermore, for those firms exporting in competition with host country manufacturers, the tariff barrier compels one of two possible strategies. Either the exporter can absorb the tariff and attempt to underprice the prevailing market; or he can pass the tariff back to the consumer in the host country by pricing above the prevailing market via a value-creating, promotional approach to marketing. Innovative companies in high income countries can not normally succeed in the field of low-priced exports, and it was expected that those who sought to export, rather than produce abroad via subsidiaries, would adopt the latter strategy and price high. Conversely it was expected that most imports from non-innovative sources would follow the "low-wage" trade route and attempt to underprice.

These expectations may be summarized as follows:

1. That the average price of U.S. exports of a given product would be higher than the average U.S. factory price.
2. That the average laid-down price of U.S. exports to Canada would be higher than average Canadian production costs, and often higher than average Canadian factory prices. It should be noted that imported goods still have to be marketed in Canada.
3. That the average laid-down price of imports from other countries would be lower than Canadian production costs.

The following data is condensed to allow a ready comparison of the relevant U.S. price statistics.

In the 34 observations made above, the U.S. average factory price was lower than the U.S. average export price on 26 occasions. It was generally believed in the industry that the U.S. export price on side-by-sides and color television was also higher than the average U.S. factory price for these products. All the contrary observations were related to three products: refrigerators, gas and electric ranges. In these product categories it is interesting to note that U.S. exports to Canada have been a relatively small percentage of total U.S. exports since the late 1950's. What seems to have happened is that consumer acceptance of new product features (i.e., side-by-sides and large capacity refrigerators, and self-cleaning ranges) has developed more rapidly in the U.S. market than in export markets, and that, in the case of electric ranges, exports to Canada are hindered by non-tariff barriers. We would expect the future to bring an increase in U.S. exports of these newer features and a decrease in U.S. exports of conventional models until the export mix is more saturated than the U.S. domestic market with the newer models. At this point the average export price will exceed the average factory price.

These comments lead to a further observation. As indicated on the various charts presented in the previous

## U.S. AVERAGE PRICE DATA

| | 1950-54 | | 1955-59 | | 1960-64 | | 1965-68 | |
|---|---|---|---|---|---|---|---|---|
| | Factory | Export | Factory | Export | Factory | Export | Factory | Export |
| Dishwashers | 150 | 192 | 141 | 154 | 134 | 154 | 135 | 141 |
| Air Conditioners | n.a. | n.a. | 147 | 203 | 149 | 187 | 138 | 157 |
| Freezers | 173 | 208 | 171 | 186 | 143 | 167 | 139 | 182 |
| Automatic Washers | 137 | 151 | 143 | 150 | 134 | 148 | 128 | 143 |
| Wringer Washers | 76 | 89 | 82 | 91 | 83 | 93 | 83 | 85 |
| Clothes Dryers | -- | -- | -- | -- | 102 | 104 | 97 | 117 |
| Refrigerators | 148 | 161 | 176 | 160 | 172 | 164 | 180 | 170 |
| Electric Ranges | 125 | 132 | 144 | 130 | 155 | 134 | 158 | 151 |
| Gas Ranges | -- | -- | 78 | 79 (1) | 105 | 88 | 139 | 94 |
| Black-and-White Television | n.a. | 169 | 131 | 135 | 126 | 130 | 100 | n.a. |

(1) 1956-60 excluding data deemed inaccurate.

Source: Derived from statistical tables presented earlier for each product.

chapter, Canadian consumers tend to account for a very large percentage of U.S. exports of relatively new products. As products mature the percentage exported to Canada decreases. In the case of room air conditioners, however, Canada never did account for a large percentage of U.S. exports - presumably for reasons of climate. Two comments may be ventured from these observations.

(a) Before trade in new products can begin, there must be, in the IMPORTING country, a perceived need or desire for the products in question. The Canadian proximity to U.S. markets and advertising tends to generate this early in Canada.

(b) The impetus to trade may be originating more often from Canadian importers, be they subsidiaries, department stores, or wholesalers, than from U.S. exporters. This is a further reason why export prices do not have to be reduced to "capture" customers.

The following data allows a comparison between import prices and Canadian factory prices and production costs.

What the above data disclose is that in every instance the landed cost of imports from the U.S. was higher than the average Canadian production cost. Since most imported appliances were brought in by subsidiaries, marketing costs and profit margins still had to be added in reaching a Canadian "factory" price. Hence the average Canadian production cost was a valid figure for comparison. What is

CANADIAN AVERAGE PRICE DATA (In Dollars)

| | 1956-59 | | | 1960-63 | | | 1964-67 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Factory Price | Prod'n Cost | Landed cost of Imports from US | Factory Price | Prod'n Cost | Landed cost of Imports from US | Factory Price | Prod'n Cost | Landed cost of Imports from US |
| Dishwashers | 190 | -- | 166 | 208 | 116 | 188 | 227 | 120 | 185 |
| Air Conditioners | -- | -- | -- | 207 | 136 | 222 | 203 | 129 | 213 |
| Freezers | 220 | -- | 200 | 170 | 137 | 218 | 141 | 128 | 233 |
| Auto Washers | 193 | 152 | 186 | 191 | 135 | 194 | 174 | 136 | 195 |
| Wringer Washers | 92 | 75 | 94 | 86 | 71 | 118 | 87 | 73 | 121 |
| Clothes Dryers | 135 | 106 | 126 | 128 | 87 | 133 | 112 | 81 | 148 |
| Refrigerators | 176 | 136 | 168 | 169 | 131 | 222 | 169 | 128 | 257 |
| Electric Ranges | 151 | 99 | 128 | 139 | 98 | 138 | 134 | 98 | 125 (2) |
| Gas Ranges (1) | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black-and-White TV | 157 | n.a. | 149 | 160 | n.a. | 168 | 135 | 108 | 165 E |
| Color Television | -- | -- | -- | -- | -- | -- | 541 | 370 | 469 |

(1) Import price data not regarded as reliable, and production cost data not available.

(2) Probable error in published data for 1964.

Source: Derived from Statistical Tables presented earlier for each product.

even more striking is that in many cases (15 out of 27 observations) the landed cost of U.S. imports exceeded the average Canadian factory price. These findings support the contention that imports from the U.S. tend to be differentiated in some significant way from Canadian production, sufficiently to command a price premium. Certainly it is clear that U.S. exporters have not gained access to the Canadian market by underpricing it, but appear either to have exported selectively from top-of-the-line models or to have marketed a full line directly at high prices. Furthermore, the tendency has been for the import price to exceed the Canadian factory price more frequently in the more recent periods - 14 out of 19 observations for the two periods covering 1960 to 1967.

These observations may be contrasted with import prices from countries other than the U.S. Freezers, refrigerators, and black-and-white television were all products subject to Japanese and European competition, and always at prices below the average Canadian production cost.

Canadian export performance was poor in all product areas - largely due to lack of product advantage. What success Canadian firms did have was in products whose markets were declining in both Canada and the U.S. (i.e., wringer washers, freezers, standard refrigerators and black-and-white television). A large percentage of television and freezer exports were captive from subsidiary to parent.

| | Refrigerators | | Freezers | | Black-and-White Television | |
|---|---|---|---|---|---|---|
| | Average Production Cost in Canada | Landed Cost of Non-US Imports (1) | Average Production Cost in Canada | Landed Cost of Non-US Imports (1) | Average Production Cost in Canada | Landed Cost of Non-US Imports (1) |
| 1963 | 130 | 71 | 134 | -- | 126 | -- |
| 1964 | 130 | 73 | 128 | -- | n.a. | 78 |
| 1965 | 125 | 58 | 127 | -- | 136 | 53 |
| 1966 | 126 | 59 | 128 | 60 | 99 | 74 |
| 1967 | 133 | 67 | 127 | 66 | 97 | 70 |
| 1968 | 133 | 67 | 126 | 70 | 99 | 65 |

Source: (1) DBS 65-007 import prices multiplied by appropriate tariff rates.

Wringer washers and refrigerators were exported at prices generally below average Canadian factory prices as the following data show.

| | Wringer Washers | | Refrigerators | |
|---|---|---|---|---|
| | Average Factory Price in Canada | Average Canadian Export Price | Average Factory Price in Canada | Average Canadian Export Price |
| 1956 | 94 | 83 | 176 | n.a. |
| 1959 | 87 | 85 | 173 | n.a. |
| 1962 | 87 | 87 (1) | 167 | 160 |
| 1965 | 85 | 82 (1) | 163 | 150 |
| 1968 | 84 | 86 (1) | 184 (2) | 172 (2) |

(1) Estimated adjustment to eliminate sales of automatics.

(2) Data is for 1967.

Source: DBS 65-004 and previous tables.

It would appear that Canadian exporters either reduced their margins to obtain exports or exported from the bottom of their product lines. Either way there did not seem to be any new technological content in Canada's exports.

4. Canadian Ownership and the Product Life Cycle

The question of Canadian ownership is usually discussed from the point of view of production capacity and will be so discussed here. However, it is worthwhile to point out that the increasing prevalence of stencil branding means that it would be possible for Canadians to have substantial control of output with little control of consumer markets. This in fact appears to be the case with

freezers, and, to a lesser extent, wringer washers. In this connection several industry executives indicated that marketing was generally a more profitable activity than production.

The general hypothesis concerning Canadian ownership was that it would increase as a product matured in its life cycle. This hypothesis springs from the expectation that Canadian firms would seldom innovate and would delay their entry into product markets until the size and growth rate of those markets was known. It proved impossible to obtain accurate year-by-year estimates by product of the development of ownership patterns; this was in any event periodically disturbed by take-overs. However, the following data does show the extent of Canadian ownership of production as at 1968.

| | Percentage of Total Production in Hands of Independent Canadian Producers |
|---|---|
| Growth Products (forecast unit sales growth greater than 15% per annum) | |
| Dishwashers | 0% |
| Air Conditioners | n.a. |
| Color television | 11 |
| Twin-tub washers | 0 |
| Mature Products (forecast unit sales growth between 0-15% per annum) | |
| Refrigerators | 17 |
| Automatic washers | 18 |
| Clothes Dryers | 19 |
| Ranges | 36 |
| Declining Products (forecast unit sales growth of zero or less per annum) | |
| Black-and-white television | 10 |
| Freezers | 67 |
| Wringer washers | 88 |

Source: Company estimates.

The above figures illustrate the extent to which Canadian-owned producers tended to dominate in declining products and avoid the risk inherent in growth products. It is an unfortunate corollary that Canadian domination occurred when unit profits were low and markets were disappearing.

## 5. Prices, Costs and Unit Gross Margins Over the Life Cycle

As has been mentioned several times in this narrative, product costs and prices were subject to many factors other than their position on the life cycle. Product mix changes constituted a major influence on prices and costs. Production costs were further influenced by changes in factor costs, and prices were influenced by changes in distribution patterns. It was, however, expected that unit gross margins would tend to be higher in the early years of a product's life and would begin to decrease as the product matured. The following table shows the trend in gross margins by product and indicates the extent to which margins on growth products were higher than those on mature and declining products.

The growth products, those with the most attractive forecasts for rapid sales expansion, clearly generated the highest absolute gross margins per unit. These were products where Canadian ownership of production was relatively low in 1968. As expected, the unit gross margins for declining products were by far the lowest, and these were the products

UNIT GROSS MARGIN BY PRODUCT IN DOLLARS
AND AS A PERCENTAGE OF FACTORY PRICE

| | 1957-60 | | 1961-64 | | 1965-68 | |
|---|---|---|---|---|---|---|
| | $ | % | $ | % | $ | % |
| Growth Products: | | | | | | |
| Dishwashers | 48 | 25 | 58 | 27 | 87 | 38 |
| Room air conditioners | -- | -- | 48 | 23 | 51 | 25 |
| Color television | -- | -- | -- | -- | 131 | 27 |
| Mature Products: | | | | | | |
| Refrigerators | 37 | 21 | 40 | 24 | 42 | 25 |
| Automatic washers | 50 | 26 | 51 | 28 | 38 | 21 |
| Clothes dryers | 33 | 25 | 39 | 32 | 30 | 27 |
| Electric ranges | 49 | 33 | 40 | 29 | 34 | 26 |
| Declining Products: | | | | | | |
| Black-and-white TV | -- | -- | -- | -- | 22 | 16 |
| Freezers | -- | -- | 26 | 16 | 11 | 8 |
| Wringer washers | 14 | 16 | 17 | 20 | 8 | 9 |

Source: Statistical tables previously presented.

in which Canadian ownership was dominant.

The behavior of the gross margin on any particular product over time was difficult to typify. In growth products, the margins appeared to be getting bigger. In declining products, they appeared to be decreasing. And in mature products no direction was evident. A few comments on these observations seems relevant.

1. Companies involved in multi-product operations use a variety of formulae for allocating fixed overhead to products. Hence gross margins do not represent marginal income contributions of the products in question.

2. Innovations or shifts in product mix within a product category are masked in the averaging and can have the effect of raising the profitability of the entire line. The absence of innovation is one major reason for the poor margins on freezers, and the other two declining products are declining because of displacing innovations.

3. Where assembly operations are in use, lower unit margins are more common because investment requirements are less.

Gross margin percentages are, of course, influenced by changes in factory price, which in turn are affected by

changes in patterns of distribution. Lower gross margins can lead to higher net profits when customers assume a major portion of the cost of marketing and administration.

In the light of these observations it is difficult to draw conclusions from the "aggregate" gross margins presented above, except to repeat that profitability is related to innovativeness in product and marketing methods.

6. Other Observations

(a) Canadian import surtax, 1962-63.

As part of its response to the currency crisis in 1962, the Canadian government imposed an import surtax amounting to 10% for most appliances. It was imposed on June 25, 1962, reduced on February 20, 1963 and removed on March 31, 1963. Its effect was to increase the duty rate by ten percentage points (i.e., from 22.5% to 32.5% in the case of washing machines). Since the surtax was in effect for less than a year it was not included in calculating the landed cost of imports. Its impact on the flow of imports in 1962-63 did not appear to be significant in the case of U.S. appliance shipments. It should be noted in this connection that, since U.S. exporters were not competing in Canada on the basis of price alone, the flow of U.S. exports could be expected to be somewhat less vulnerable to tariff fluctuations.

(b) Marketing costs.

Very few companies in the appliance industry kept any extensive records on unit marketing costs. From the few who did, it was discovered that marketing costs varied widely by product and by type of firm, and were very much subject to the strategies of the firms involved. It was expected that unit marketing costs would be higher for newer products, and that large multi-product firms would have lower unit marketing costs than more specialized firms. Although the following data appear to support these expectations, it should be emphasized again that they were drawn from relatively few firms, and that in some cases rather arbitrary allocations of costs to products were involved.

AVERAGE UNIT COST OF MARKETING
IN CANADA, 1967

| | |
|---|---|
| Dishwashers | $53.00 |
| Automatic washers | 36.45 |
| Refrigerators | 35.00 |
| Electric ranges | 12.00 |

Source: Confidential Company Data.

It was hoped to be able to indicate that there were economies of scale in marketing similar to those from large scale production, and that product diversity within the firm was a form of response to the pressures of these economies. This would appear to be an area worthy of further reserach. The following data do indicate that (a) the multi-product firm enjoyed lower unit costs of marketing and administration,

COMPARISON OF MARKETING COSTS BETWEEN LARGE MULTI-PRODUCT FIRM AND SMALLER SPECIALIZED FIRM

| | Large Multi-Product Firm | | Smaller Specialized Firm | |
|---|---|---|---|---|
| | Product 1 | Product 2 | Product 1 | Product 2 |
| Shipping, warehousing and distribution | 35.8% | 47.5% | 17.0% | 8.1% |
| Advertising and promotion | 23.6 | 9.7 | 28.0 | 21.5 |
| Marketing research | 1.4 | 1.1 | -- | 7.0 |
| Selling costs | 16.3 | 16.0 | 48.2 | 34.4 |
| Service costs | 18.0 | 18.5 | 2.2 | 14.0 |
| Other | 4.9 | 7.2 | 4.6 | 15.0 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |
| Total Unit Cost of Marketing | $37.00 | $34.36 | $69.25 | $44.55 |
| Total Unit Cost of Administration | 8.00 | 7.70 | 41.00 | 32.00 |

Source: Confidential company data (2 selected companies).

and, (b) advertising and marketing research costs, which tend to be fixed costs, were a smaller percentage of the multi-product firm's total marketing costs. These facts suggest the possibility that marketing economies of scale do exist and that they are related to the growth of the firm.

Annual marketing expenditures by type of company varied widely. One major multi-product company spent over $6 million in 1967 while a major limited line company spent half of this amount. A smaller multi-product company spent about $1.2 million while a small single product firm spent $360 thousand. A full marketing system is clearly a costly investment. Its advantage is that, once it is made, the marginal cost of marketing an additional product declines. This condition tends to stimulate more rapid adoption of new products.

Since one company had in fact recently experienced a major growth hurdle in its decision to switch from distributors to direct selling, an attempt was made to trace the behavior of marketing and administrative costs before and after the event.

This example clarifies the effect of corporate strategy on unit marketing costs, and highlights the evident danger of assuming that marketing costs in any one year are indicative of prior or subsequent years. It also illustrates

BEHAVIOR OF MARKETING AND ADMINISTRATION COSTS DURING A SWITCH FROM DISTRIBUTORS TO DIRECT SELLING

| | Period 1 | Period 2 | Period 3 | Period 4 |
|---|---|---|---|---|
| | 100% Distributors | 60:40 Dist:Dealer | 30:70 Dist:Dealer | 20:80 Dist:Dealer |
| Unit Sales Index | 100 | 150 | 270 | 375 |
| Unit Cost of Marketing | $21.00 | $33.80 | $63.50 | $56.70 |
| Unit Cost of Administration | 11.50 | 12.20 | 40.70 | 33.50 |
| Unit Profit | 28.60 | 14.00 | 4.07 | 29.80 |

Source: Confidential company data.

a type of marketing scale economy: fixed selling costs are allocated to an increasing number of units as sales grow. In this particular example, the rapid sales growth brought about substantial production scale economies also. The two types of economy were built into the company's long-term plan for growth.

## Summary

The findings may be summarized as follows:

1. The hypothesis that the Canadian propensity to import finished goods would be high when products were new, and would decline over time, was strongly confirmed. Canadian producers in the appliance industry turned out to be very dependent on U.S. firms for innovations.

2. The hypothesis that component parts imports per unit made in Canada would decline over time was difficult to establish from published data. Such data as was available, and the opinions and estimates of executives did support the hypothesis and lead to the conclusion that Canadian manufacturers moved from assembly to integrated production gradually as volume increased. Canadian-owned producers had more of an incentive to make this move quickly.

3. The hypothesis that the average price of U.S. exports would be higher than the average U.S. factory price of

the same products was strongly confirmed. U.S. producers appeared to have a technological content in their exports that enabled them to command premium prices.

4. The hypothesis that the landed price of Canadian imports from the U.S. would exceed the average Canadian production cost of the product was strongly confirmed. In most product areas the landed price was even higher than the average Canadian factory price (for years subsequent to the beginning of Canadian production), indicating that imports from the U.S. were not price competitive. The reverse was true of imports from other countries.

5. The hypothesis that Canadian exports would normally be at prices below the average Canadian factory price of the products exported was confirmed in the case of wringer washers and refrigerators. Non-captive exports of other major appliances were negligible. This finding points to a lack of product advantage in Canada and a resulting need to export on the basis of price.

6. The hypothesis that Canadian-owned firms would be late entrants into production of new products was supported to a point by current share of market statistics. Canadian-owned producers tended to dominate in products whose markets were declining and where the incidence of stencil branding was highest.

7. The hypothesis that gross margins would be higher for products early in their life cycles was strongly confirmed by company executives and could be inferred from comparative product profitability figures. Gross margin for any particular product category over time was somewhat more difficult to establish or understand. It was difficult to obtain extensive time series data on costs, and it was impossible to separate other factors, such as mix and innovation, from the aggregate product data obtained.

8. The hypothesis that direct capital investment would tend to increase as a product matured was not tested because of an inability to generate sufficient data. It would appear, however, from the evidence on gradual displacement of imported components, that this hypothesis may merit further inquiry.

# CHAPTER XVII

## IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The research described in previous chapters has provided a clear and very significant picture of the Canadian electrical appliance industry. The large-scale commercial exploitation of new appliance products has invariably been initiated by large U.S. corporations with extensive market reach. The entry of new products into Canada has been via the subsidiaries of these companies. Independent Canadian companies have tended to delay their entry into manufacturing new products until the market for them in Canada stabilised and grew to a point where they could expect a reasonable volume to sustain production. U.S. subsidiaries, on the other hand, were in a position to move gradually into the market at an early stage; first by imports, then by assembly, and ultimately as integrated manufacturers. Their ready access to parent company research, designs, components and marketing programs helped to make their early entry smooth, profitable and relatively risk-free.

Because subsidiaries were normally in the forefront in introducing new products to the Canadian consumer, they had in effect an incentive to invest heavily in marketing systems so as to reduce the marginal cost of new product (or new model) introductions. Such systems were often modified versions of parent company marketing systems. They were designed primarily to develop and maintain a strong brand image which would generate consumer confidence in all of their current and subsequent product offerings. Comprehensive advertising and promotional programs, extensive market research and product line planning, and frequent style and feature changes were all used in an effort to maintain brand differentiation in the market. Several executives expressed the view that fixed costs involved in developing and maintaining such marketing systems were generally more than could be sustained by the sales volume and profitability of any independent Canadian firms.

There was little doubt that the names and products of the large U.S. subsidiaries were better known to most Canadian consumers, and were often able to command a price premium over the products of Canadian independents. It would seem reasonable to speculate that the problem of consumer acceptance of new product developments was more readily overcome by subsidiaries whose more familiar brand names were more likely to be "trusted".

From all standpoints: the cost of research, de-

sign and development; the cost of establishing and maintaining marketing systems; and the cost of gaining consumer acceptance; independent Canadian companies have had difficulty competing economically with U.S. subsidiaries in developing and marketing new products. They have therefore been obliged to compete in other ways. Essentially their approach has been to try to bring established products to consumers at slightly lower cost, and to concentrate on difficult-to-reach market segments, such as rural markets. The innovative efforts of Canadian independents have of necessity been channelled into (a) ways of reducing production costs in multi-product, "low volume" plants, and (b) ways of discovering and servicing small, overlooked market segments. For most products, however, Canadian independents, because of their lateness of entry and resultant small initial market share, tended to have higher production costs and lower factory prices than U.S. subsidiaries. Their ability to survive has been based in large part on operating with low management and marketing overheads. This has been particularly true in the case of mature or declining products, such as freezers and wringer washers.

These economic conditions have led many Canadian independents to seek private and stencil brand business as a means of increasing production volume without the management and marketing input that would normally be required. Certainly, the ability to survive in stencil brand business

requires some strategic skills itself which are evidently not in abundant supply.

Increasingly, private brand buyers are seeking reliable long-term sources of supply that will be capable of adapting quickly to advances in technology. For example, one major Canadian appliance manufacturer is reported ready to invest in foam-in-place facilities to manufacture freezers if it could obtain a major private label account. The investment requirement is high and extensive production skills will be needed, but, by comparison, the marketing and management cost per unit of output will be relatively small. Furthermore the existence of the facilities will benefit the company's own brand names and can be used in refrigerator insulation to considerable advantage. Private branding can, it appears, be particularly beneficial to manufacturers when they do not become totally dependent on it. This freezer plant, when built, is expected to be competitive with any facility in North America, and will provide the company with an excellent profit opportunity on sales of its own brand. This is an important advantage because most Canadian independents who did sell some of their output through their own sales force generally did so at higher unit marketing costs than U.S. subsidiaries.

It is interesting to note that most subsidiaries were not extensively involved in private brand business. Clearly, these firms, having committed themselves to high

marketing and management overheads, had to control their own marketing activities. The essence of private brand arrangements is that the customer (e.g., the department store) is responsible for much of the marketing task and obtains a preferential price for this reason. It appears that subsidiaries will not be major participants in private brand business, except where they are late in the market or have an ownership interest in the retail store involved, unless they can arrange to perform the marketing function on behalf of the department store (i.e. product line development, advertising and sales training) and obtain a price to cover.

It seems likely that U.S. subsidiaries will continue to emphasize strategies of product differentiation and product innovation, while Canadian independents come into their own where there is product homogeneity and private branding. In these circumstances, the appliance industry in Canada is not likely to develop any product advantage vis-a-vis its U.S. counterpart, and is unlikely to develop any premium-priced export markets.

Canada's appliance exports to the U.S., in the short term at least, will be restricted to mature or declining (and hence low margin) products, and will have to be marketed on the basis of price competition via U.S. central buying organizations. Such products as freezers and wringer washers have been marketed extensively in Canada through private

and stencil brand arrangements for many years. Thus from the point of view of the producer, price has become the critical marketing factor. Commenting on the possibility of exporting freezers and wringer washers to the U.S., executives of independent Canadian companies indicated that they would have to seek private brand accounts and hence underprice existing suppliers of comparable appliances. They viewed the U.S. import tariff as an important hindrance in this connection. With the evident possibility of obtaining private brand orders in advance of construction of manufacturing facilities, independent Canadian companies may well be able to achieve the scale, through private branding, to match or improve upon U.S. production costs. Thus in these particular products, Canadian independents may be able to compete without the presence of tariffs.

It was in the area of direct marketing and new product development that Canadian independents lacked the organizational power of U.S. subsidiaries. Canadian-owned production was a much smaller share of total Canadian output for newer products. The timing of entry of Canadian independents was generally related to the size of the total market and the prevailing price structure. If U.S. appliance makers did not face a Canadian import tariff, and chose to rationalise their production operations between Canada and the United States, they would be in a position to sell in Canada at prices which would make the entry of Canadian in-

dependents increasingly difficult. In effect the independents would find it difficult to underprice the market, and would be hardpressed to find any competitive advantage in their product offerings with which to sustain a price premium.

On the other hand, the Canadian independents' loss would naturally accrue to the U.S.-owned subsidiaries, who could benefit from tariff removal both by rationalizing their production systems and by integrating their marketing and management systems on a continental basis. They could clearly effect significant savings in both of these areas, and would be in a position to bring their products to the Canadian consumer at lower prices, Furthermore, the Canadian consumer would also have access to new product developments at or close to U.S. prices almost as soon as the U.S. consumer. Under present arrangements, the tariff plus the duplicated marketing and management systems of subsidiaries result in very high prices in Canada for imported new appliances, and tend to retard their rate of acceptance. The problem continues even when subsidiaries begin to assemble in Canada, because of the tariff on components. Clearly the tariff blunts the diffusion of U.S. innovations to the Canadian consumer. The magnitude of these problems and potential advantages may well be deemed to outweigh the importance of the presence of Canadian independents in the appliance industry.

It should also be clear, however, that in the ab-

sence of the tariff, new products may reach Canada as imports from the U.S. at least until they reached the mature to declining stage of their life cycles. They may in fact continue to be imported indefinitely, because the decision by a parent company to build a new manufacturing facility in Canada when extensive facilities already exist in the U.S. will not be made on the basis of relative production costs only. The decision environment will involve alternatives such as investment in the expansion of U.S. facilities which may have marginal productivity advantages that outweigh the temporary Canadian wage advantage. Furthermore, where an investment in Canadian facilities would have to be very substantial to achieve access to most economies of scale, the resulting dislocation of U.S. facilities may be untenable to the parent company. Certainly, there is no assurance that parent companies in the U.S. would have sufficient incentive under a tariff-free system to begin to manufacture products in Canada when they reached their maturity stage.

It seems likely in the appliance industry that the U.S. companies would integrate their subsidiary management systems by transferring them into the parent organizations, and that they would run their Canadian subsidiaries either as straight sales offices, or as sales offices plus branch manufacturing plants specializing in a product line assigned from head office. This appears to be what happened under the Auto Pact. The specialized Canadian plants would then be continually in danger from displacing innovations originating

in the U.S., and threatening to capture the market currently supplied by Canadian production. The economic viability of subsidiary production operations would be continually under review by parent organizations as market conditions changed under the impetus of innovation. Since managerial and marketing decision power would logically be centralized in the U.S., it is likely that some legislated safeguards would be necessary on an ongoing basis to ensure the survival of Canadian-based production operations, and with a varied and changing product mix, these may prove troublesome to enforce.

## Public Policy Aspects

To the extent that the appliance industry is similar to other industries where Canadian independents are operating side-by-side with U.S. subsidiaries, the foregoing observations have important implications for public policy. To date the question of tariff removal has been addressed largely in terms of the savings inherent in production rationalization by subsidiaries. Very little attention has been paid to the savings inherent in marketing and management integration, nor to the dynamics of new product innovation. In the Auto Pact, for example, the Canadian government in effect required that a certain share of the continental automobile employment to future Canadians. It did not do the same for future Canadian managers or marketers.

There are, furthermore, some special problems that could arise from the loss of managerial and marketing con-

trol under the reality of production rationalization. They are epitomized perhaps by the plight of several independent Canadian appliance manufacturers who have been able to specialise their production operations because of major private brand orders, only to find that their improved efficiency was accompanied by lower profits. The value of their output had diminished more than its cost. The point to be made is that "value added" is not only a matter of efficiency, but also a matter of price. If rationalized Canadian plants were "assigned" relatively low margin products or models, the Canadian value added may not rise with the increase in productive efficiency. Also, as this study has illustrated, the profitability of appliance products is related to their newness or to the extent of new feature innovations introduced over time, and is clearly a moving rather than a fixed factor. The possible loss of managerial and marketing control by subsidiaries would constitute a decrease in control over the timing and direction of adaptation to changing conditions. There would be involved in any such action a degree of irreversible dependency on Canada's part. Before any further trade pacts of this kind are entered into by the Canadian government, it seems logical that <u>prior</u> consideration be given to whether the industry in question could be made competitive rather than dependent:

1. Is it feasible to support Canadian-owned firms in the areas of new product development, or rapid imitation, and in the area of marketing abroad. It should be recognized that this would require a form

of creative government involvement that has not hitherto been forthcoming. The successful exploitation of new product development is not stimulated by the mere subsidizing of "pure" research activities. An extensive investment is required also in the areas of product development, marketing and management before the infra-structure for coping with innovation in an economical way is complete.

2. Is it possible to stimulate U.S. parents to grant their Canadian subsidiaries some increased control over marketing and research activities in certain selected fields? This recognizes the fact that many subsidiaries have already invested in extensive marketing and management systems and constitute Canada's best-organized vehicles for innovative competition both at home and abroad. The difficulty of creating such systems is vast indeed and it would be disastrous to see them absorbed into centralized parent company systems under rationalization. It would seem desirable to concentrate on modes of incentive that would induce parent companies to enlarge their research and management activities in Canada, and to allow their Canadian subsidiaries to exploit their unique advantages in other countries.

3. Finally, where a move toward economic integration between Canada and the U.S. is deemed necessary, and

the irreversible nature of such a policy should be clearly understood, the resulting trade pact must take into account the dynamics of industrial innovation. The Canadian government must be as concerned about research, marketing and management functions in Canada as it is about production jobs.

Suggestions for Further Research

1. This study has inherited the limitations of the industry to which it was restricted; a consumer goods industry involved with major products where scale economies were prevalent. For purposes of subsequent generalization, the hypotheses of this thesis should be examined in other industry conditions. Producer goods industries such as petrochemicals and electronic components appear to be good candidates, since there already exists some pressure to consider possible U.S.-Canadian industry integration.
2. The concept of production rationalization that appears to have dominated Canadian trade policy with the U.S. has its roots in the notion of economies of scale in production. It appears from this study that, from the standpoint of the firm, there are also important economies of scale in marketing and management which influence corporate strategies in important ways. A study of the magnitude and implications of such scale

economies may yield useful new insights for public as well as corporate policy.

3. Historically, the question of international trade has been viewed from the standpoint of the exporting country and its relative production costs. This study has illustrated that exports from the U.S. were generally higher priced than Canadian production and that they tended to be directed towards countries with similar demand structures. Furthermore, with some products, the initiative to trade came from Canadian importing firms, often department stores. The role of importer initiative in the diffusion of foreign innovations into the domestic economy appears to constitute a very appealing topic for further study. It might be expected for example that importer initiative would be more important in differentiated products, and in countries with few foreign controlled subsidiaries.

4. It was observed that there were very effective barriers to trade other than tariffs. Patents in the case of television and C.S.A. standards in the case of electric ranges blocked almost all imports for many years. Furthermore, the Canadian sales and excise tax regulations tended to encourage imports of products with high profit margins (often new products), by taxing Canadian production at distributor price while taxing

imports at laid-down cost. The question is one of whether to recognize marketing costs and profits in arriving at the tax base.

The impact of these various non-tariff stimulants and depressants on trade flows would appear to merit more attention than it has so far been given.

5. It has been suggested that the Canadian government should give some thought to the stimulation of Canadian competitiveness in innovative products. In this connection it would be very useful to follow the process of diffusion of a major Canadian innovation into international markets to obtain a more precise understanding of the problems facing the innovator. A consumer product such as the snowmobile would be a good recent candidate for study since it had to face the problems of initial consumer acceptance in many countries.

6. Current explanations by economists of the theory of international capital flows are not oriented towards private direct investment, despite the fact that direct investment has grown to represent a substantial portion of total capital flows. From the standpoint of the firm, this study has shown that direct investment is viewed as an alternative to the export of goods; another way of exploiting the benefits of a particular market. To the extent that the life cycle concept yields better insights into the international flow of

goods, it is equally likely to help explain flows of direct investment capital. In this connection, the concept of direct investment would have to be enlarged to cover the market value of foreign holdings rather than the mere transfer of funds across borders, and would have to include reinvested earnings and local borrowing of subsidiaries. The problem of measuring direct investment flows is elaborated by Kindleberger in "The Theory of Direct Investment", the first of six lectures compiled in his book "American Business Abroad", Yale University Press, 1969.

## APPENDIX A

## SOURCES OF STATISTICAL DATA

1. Company production estimates plus units imported.
2. Merchandising week.
3. U.S. Exports FT 410, Bureau of the Census (U.S. dollar figures are multiplied by the exchange and duty rates in arriving at landed cost of imports).
4. DBS 64-202.
5. Estimated from company data.
6. Estimated by companies - includes sales of imports.
7. U.S. industry data, supplied by a U.S. appliance maker. Figures marked E are estimated by the writer from U.S. retail prices. Retail margins were close to 50% in 1958 and earlier years.
8. Canadian Imperial Bank of Commerce, London, Ontario.
9. Supplied by participating companies.
10. Merchandising Week - from U.S. Customs data.
11. DBS 43-201 (1950-56): DBS 43-204 (1957-68). (Does not include sales of imports).
12. DBS 43-201, DBS 43-204 plus units imported.
13. Company estimates of industry sales.
14. Computed from information supplied by companies.
15. DBS 65-007 (units and value).
16. DBS 43-201/5 plus imports, less adjustment for colour T.V. from 1963 on.

17. DBS 43-201/5 (not including sales of imports), less adjustment for value and volume of colour T.V. from 1963 on.
18. DBS 41-209 and 43-204 plus units imported.
19. DBS 41-209 and 43-204 - does not include sales of imports.
20. Derived from average production cost data by product category supplied by participating firms.
21. The difference between average factory price and a weighted average of production cost and import price. The weighting was based on the % of imports to domestic sales.
22. The difference between average factory price and average cost of production. Imports are not included in either figure.
23. Department of Industry, Trade and Commerce, Ottawa.
24. U.S. Electronics Industry Association (EIA).

NOTE: This appendix duplicates the information on pages 95 and 96, and is placed here for ease of reference.

## APPENDIX B

## STATISTICAL TESTS OF SIGNIFICANCE

a. Canadian import propensity over time (table on page 244)

Out of 32 observations of the change in direction of import propensity, 27 were found to decline. This finding can be tested against a null hypothesis of "no direction" in changes (i.e., that there would be as many increases as decreases) as follows.

| | Expected | Observed | (E-0) | $(E-0)^2/E$ | | |
|---|---|---|---|---|---|---|
| Increase in import propensity | 16 | 5 | 11 | 121/16 | = | 7.56 |
| Decrease in import propensity | 16 | 27 | -11 | 121/16 | = | 7.56 |
| | 32 | 32 | | | | 15.12 |

The probability of so large a number of decreases occuring by chance, given the null hypothesis is extremely remote. The chi square value for a 0.005 probability on one degree of freedom is 7.88 which is considerably exceeded by the above calculation.

b. Comparison of average U.S. export price to average U.S. factory price. (table on page 253)

The null hypothesis is that there would be no consistent difference between the average U.S. export price and the average U.S. factory price of the same product category. The data on page 253 show 34 comparative observations in which the export price exceeds the factory price on 26 occasions. These data may be tested against the null hy-

pothesis via a chi square test of significance as follows.

| | Expected | Observed | (E-0) | $(E-0)^2/E$ | | |
|---|---|---|---|---|---|---|
| U.S. export price higher | 17 | 26 | -9 | 81/17 | = | 4.76 |
| U.S. factory price higher | 17 | 8 | 9 | 81/17 | = | 4.76 |
| | 34 | 34 | | | | 9.52 |

If the null hypothesis is true, the probability of a chi square value exceeding 6.63 (given one degree of freedom) is 0.01. The computed value of 9.52 is a highly significant refutation of the null hypothesis. U.S. exporters of major appliances clearly tend to export at prices higher on average than their domestic factory prices.

c. Comparison of the average laid down cost of Canadian imports from the U.S. to average Canadian factory prices

As noted on page 54 the average laid down cost of Canadian imports of major appliances from the U.S. was consistently higher than the average Canadian production cost of the same products in all 23 observations taken. Since imported products have still to be marketed in Canada one would expect, a priori, that the average laid down cost of imports from the U.S. would certainly be lower than the average Canadian factory price of the same product categories. In fact if one assumes a model of price competitive trade flows, one's expectation would be that domestic factory prices, which include the manufacturer's marketing costs, would always be higher than the laid down cost of imports. Because of dif-

ficulties working with such a null hypothesis in a chi square test, a more conservative null hypothesis was used as follows.

The data on page 255 indicate that, for the period from 1960 to 1967, fourteen out of nineteen observations showed the Canadian factory price to be less than the import price. This observation is significant even when tested against a null hypothesis of no difference as the following calculations show.

| | Expected | Observed | (E-0) | $(E-0)^2/E$ | |
|---|---|---|---|---|---|
| Import price higher | 9.5 | 14 | -4.5 | 20.25/9.5 | = 2.13 |
| Factory price higher | 9.5 | 5 | 4.5 | 20.25/9.5 | = 2.13 |
| | 19 | 19 | | | 4.26 |

With one degree of freedom, the chi square value at the 0.05 level of significance is 3.84. Hence we can reject even as favourable a null hypothesis as "no difference" between the two price levels. Clearly the landed cost of imports from the U.S. did exceed Canadian factory prices on average for the period from 1960 to 1967. However, when data from 1956-59 are added, we have 15 out of a total of 27 observations in which the import price exceeds the factory price. This is clearly not significant when measured against a null hypothesis of "no difference" (chi square value is only .60). In order to become significant at the .05 level, the null hypothesis would have to favour a lower import price by 17 observations out of 27 which would not seem unreasonable in

the light of the foregoing observations.

d. Canadian ownership related to newness of product

The table on page 259 showed the percentage Canadian ownership of production according to the projected growth rate of each product. The ten observations were grouped into three classifications: growth products, mature products, and declining products. It was hypothesized that Canadian ownership would be smallest at the new end of the product spectrum, increasing as the product aged. The mean values of Canadian ownership at each stage were: growth products 3.67%, mature products 22.5%, declining products 55.0%, which would certainly appear to support the hypothesis. Two methods were used to test the significance of these observations against the null hypothesis of no relationship between Canadian ownership and newness of product. The results were as follows.

1. Analysis of variance

The terminal program "$ ANVAR" yielded, for these data, an F ratio of 3.97 with a probability of .07. The F ratio for 95% confidence would have to be 4.74 and for 90%, 3.26. The significance of this finding is somewhat marginal, but then analysis of variance is rather a gross test. The significance of the result was greatly reduced by the large variance within the "declining product" category occasioned by the relatively low Canadian ownership of black and white television production.

2. Dummy variable regression analysis

The terminal program "$ MLREG" yielded a regression equation of Y = .93 + 25.67 X, where Y is the level of Canadian ownership and X = 0 for growth products, 1 for mature products and 2 for declining products. The T ratio was 2.93 indicating a probability of less than .01 of there being no relationship between X and Y. The portion of the variability in Y explained by variability in X was .565.

This test supports and adds further weight to the analysis of variance results.

e. Gross margin related to newness of product

The data on page 261 show calculations of unit gross margins for growth products, mature products and declining products. The hypothesis was that margins would be high when a product was new, declining over the product's life. Mean values for each classification tended to support this hypothesis over a null hypothesis of "no relationship" as follows: growth products 30%, mature products 25%, declining products 11%. Two tests of significance were made on these data.

1. Analysis of variance

Yielded and F ratio of 12.9 with a probability of .005. This is highly significant at the 99% level.

2. Dummy variable regression analysis

Yielded a regression equation of Y = 31.8 - 9.5 X where X = 0 for growth products, 1 for mature products and

2 for declining products. This equation explained 75% of the variability of Y (gross margin), and the probability of no relationship between X and Y was well below .01 (T ratio of -4.56).

f. Sensitivity of classification

The foregoing attempts to relate Canadian ownership and unit gross margins to the forecast growth rate in sales relied on a mode of classification of products into categories (i.e., growth products, mature products and declining products). The question arises, would changes in the parametres of classification invalidate the significance of the findings? In order to resolve this question, regression analyses were run using actual forecast growth rates by product with the following results.

| Products | Forecast Annual Growth Rate* | Estimated Unit Gross Margin % | Estimated % Canadian Ownership |
|---|---|---|---|
| Dishwashers | 21.6% | 38% | 0% |
| Air conditioners | 17.0 | 25 | n/a |
| Colour television | 33.2 | 27 | 11 |
| Twin tubs | 15.0 | n/a | 0 |
| Refrigerators | 5.4 | 25 | 17 |
| Automatic Washers | 7.5 | 21 | 18 |
| Clothes dryers | 6.0 | 27 | 19 |
| Ranges | 5.7 | 26 | 36 |
| Black and white T.V. | -6.2 | 16 | 10 |
| Freezers | 0 | 8 | 67 |
| Wringer washers | -5.0 | 9 | 88 |

* based on industry forecasts for 1973 compared to actual 1968 production (i.e., the five year growth percentage divided by five). Industry forecast on twin tubs was not available, and the forecast shown is a conservative estimate based on recent past growth.

The regression equation for Y = growth rate and X = unit gross margin was Y = -12.7 + .956 X, with a T ratio of 2.84 which indicates significance close to the 99% level against a null hypothesis of no relationship. The index of determination was .55 indicating that 55% of the variability in Y is accounted for by variability in X.

The regression equation for Y = growth rate and X = percentage Canadian ownership was Y = 14.6 - .24 X with a T ratio of 1.95 indicating a level of significance close to 95% against a null hypothesis of no relationship. The index of determination was .39.

From these calculations it was concluded that the significance of the relationship was unlikely to be influenced by changes in the parametres of classification.

g. Canadian ownership compared to gross margin

It was decided to run a regression analysis directly on Canadian ownership and gross margins in the expectation of finding a significant inverse relationship. This would establish the significance of the assertion that Canadian ownership of production of a given product increases as its gross profit margin decreases. The result was a regression equation Y = 29.6 - .26 X where Y = unit gross margin and X = Canadian ownership. The probability of no relationship was less than .01 (T ratio of -3.48), and equation explained 67% of the variability in Y. A significant inverse relation-

ship is clearly established.

h. Import substitution

What size must the Canadian market achieve before manufacturers in Canada move to displace imports? This is a decision taken by individual firms and will clearly be influenced by the firm's expected share of the Canadian market as well as the absolute market size. It will, furthermore, be expected to vary by product depending on the magnitude of scale economies and the level of the tariff. Nevertheless, it was felt useful to compile the data available in such a way as to illustrate for each product the market size that appeared necessary to trigger import displacement.

The eight products listed on the following page fall neatly into two categories. First, those where producers in Canada were achieving original entry to the market (e.g., dishwashers, air conditioners, freezers, colour television); and, second, those where Canadian producers were achieving an increased share of the market (e.g., automatic washers, clothes dryers, gas ranges and colour television).

In the former category, the entry of Canadian producers was generally at a very low level of market saturation (around 1% in three cases and 6.5% in the other). In all four of these product categories, the rate of growth of the market during the period of greatest displacement was relatively high as the following data depict.

# CANADIAN IMPORT DISPLACEMENT COMPARED TO MARKET SIZE

| Product | Period of Major Import Displacement | Import tariff rate beginning & end | | Import % at beginning & end | | Unit sales in Canada beginning & end | | Saturation % beginning & end | |
|---|---|---|---|---|---|---|---|---|---|
| Dishwasher | 1960-1964 | 7.5% | 22.5% | 93% | 39% | 14.7 | 31.4 | 1.3% | 2.2% |
| Air Conditioner | 1960-1963 | 7.5% | 7.5% | 100% | 36% | 22.9 | 31.0 | 1.0%E | 1.9% |
| Freezers | 1956-1961 | 20% | 20% | 79% | 13% | 58.0 | 106.0 | 6.5%E | 13.1% |
| Automatic Washers | 1960-1963 | 22.5% | 22.5% | 32% | 11% | 111.1 | 135.8 | 12.2% | 18.3% |
| Clothes Dryers | 1960-1963 | 22.5% | 22.5% | 19% | 7% | 136.9 | 157.4 | 12.1% | 21.6% |
| Refrigerators | 1958-1963 | 20% | 20% | 28% | 2% | 314.0 | 305.0 | 85.2% | 94.2% |
| Gas Ranges | 1955-1963 | 22.5% | 22.5% | 54% | 14% | 68.0 | 47.8 | 18.0%E | 18.6% |
| Colour T.V. | 1965-1966 | 20% | 20% | 79% | 17% | 12.0 | 100.0 | 0.4% | 2.4% |

Growth of Market During Initial Displacement

| | Displacement Period in Yrs. | Market Growth During Displacement | Average Annual Market Growth |
|---|---|---|---|
| Dishwashers | 4 | 140% | 35% |
| Air Conditioners | 3 | 35% | 12% |
| Freezers | 5 | 83% | 17% |
| Colour T.V. | 1 | 730% | 730% |

It would appear from the above data that the entry of Canadian-based producers was influenced by the attractive growth prospects of the products in question. It would be inappropriate to try to compare absolute market size during displacement with optimal plant size, because, as has already been established, much of the Canadian "production" during this period was essentially from assembly operations only.

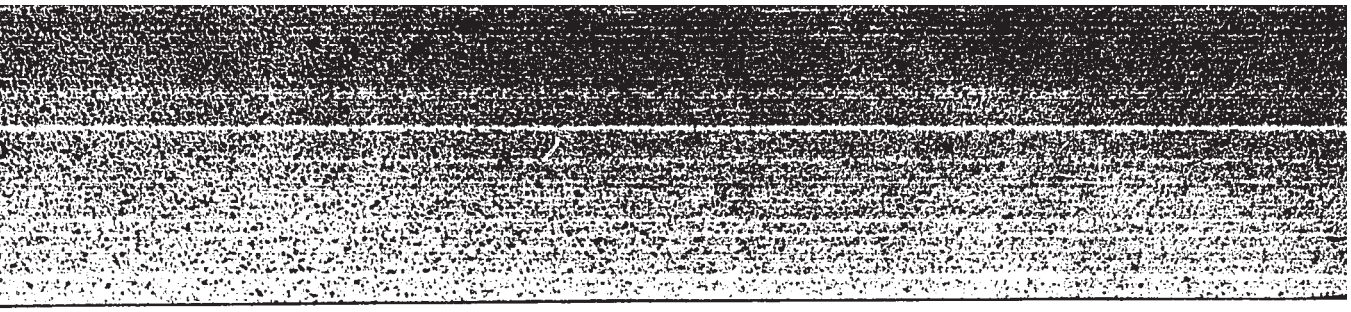
When we examine the other four products we obtain a somewhat different picture. Growth rates during the incremental displacement process were decidedly unattractive as the following data show.

Growth of Market During Incremental Displacement

| | Displacement Period in Yrs. | Market Growth During Displacement | Average Annual Market Growth |
|---|---|---|---|
| Automatic Washers | 3 | 22.2% | 7% |
| Clothes Dryers | 3 | 15.0% | 5% |
| Refrigerators | 5 | (3.0%) | (1%) |
| Gas Ranges | 8 | (30.0%) | (4%) |

In seeking an explanation for the increase in import displacement for the above products, one is struck by the similarity of their displacement time periods: all of them

end in 1963. It would therefore appear likely that a common event has influenced the displacement process in all four products. In this connection, 1962 was the year the Canadian dollar was devalued and temporary import surcharges were imposed. These surcharges were lifted during 1963. If we compare the Canadian import propensity for these four products between 1961 and 1963, we find that, on average, it declined by about 58%. Thus it would appear that the incremental displacement in these four products was substantially influenced by this combination of currency devaluation and tariff surcharge. This was not the case with the four products discussed earlier. In two cases, the displacement period did not include the year 1962; in the other two cases the average decrease in import propensity between 1961 and 1963 was only 25%, considerably smaller than the decrease between 1960 and 1961. Thus it would appear that the changes in currency and tariff were less influential as determinants of trade patterns in these newer products.



# END OF REEL